INDUSTRIAL REFRIGERATION

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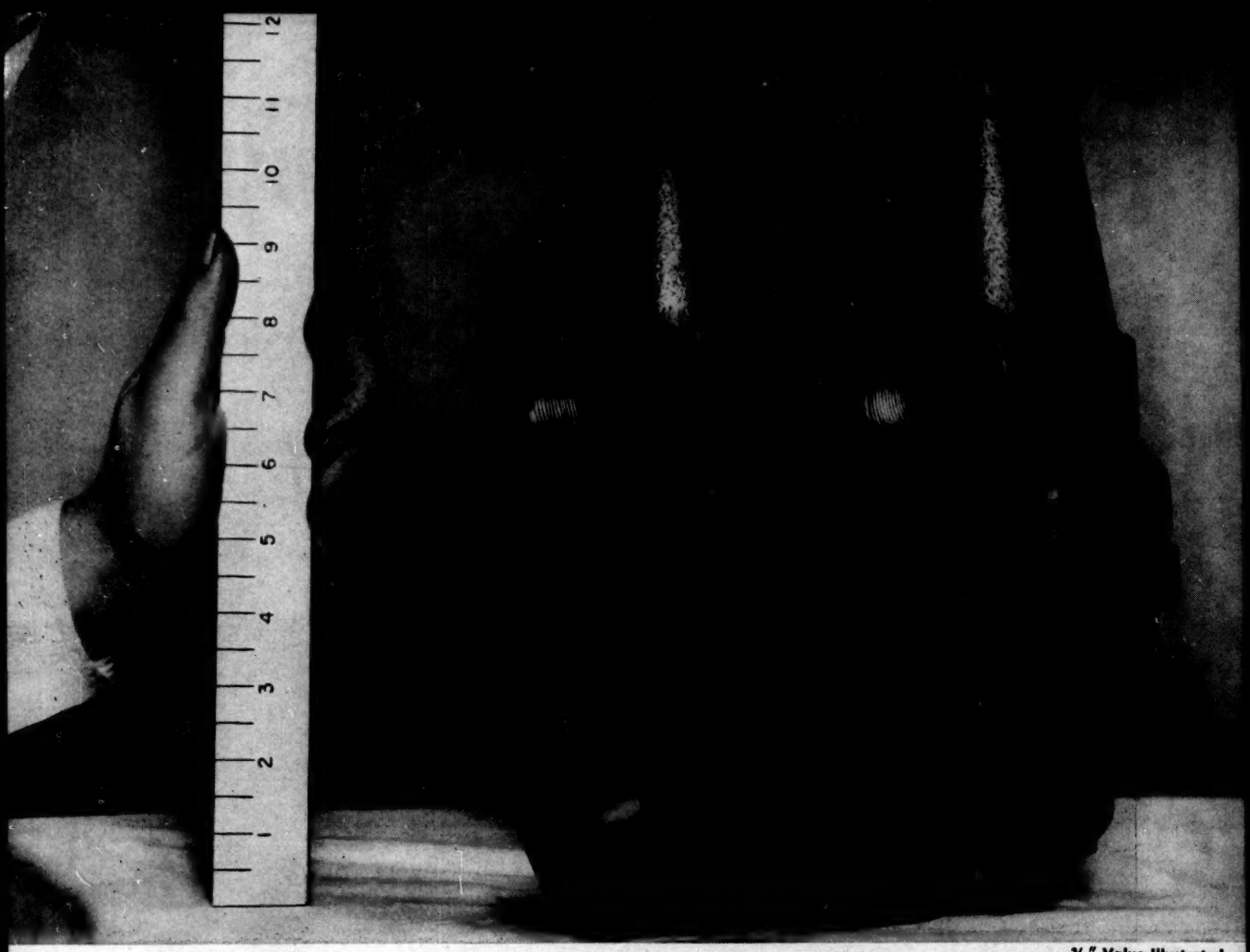
VOLUME 132

NUMBER 6

JUNE, 1957



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DESIGNED TO MEET ASME AND ASA B-9 standards York's new safety relief valves also have National Board Certification for capacity. They're available for use with ammonia, "Freon", "Genetron", and "Isotron"... either singly or in dual assemblies . . . with settings from 50 to 300 pounds.

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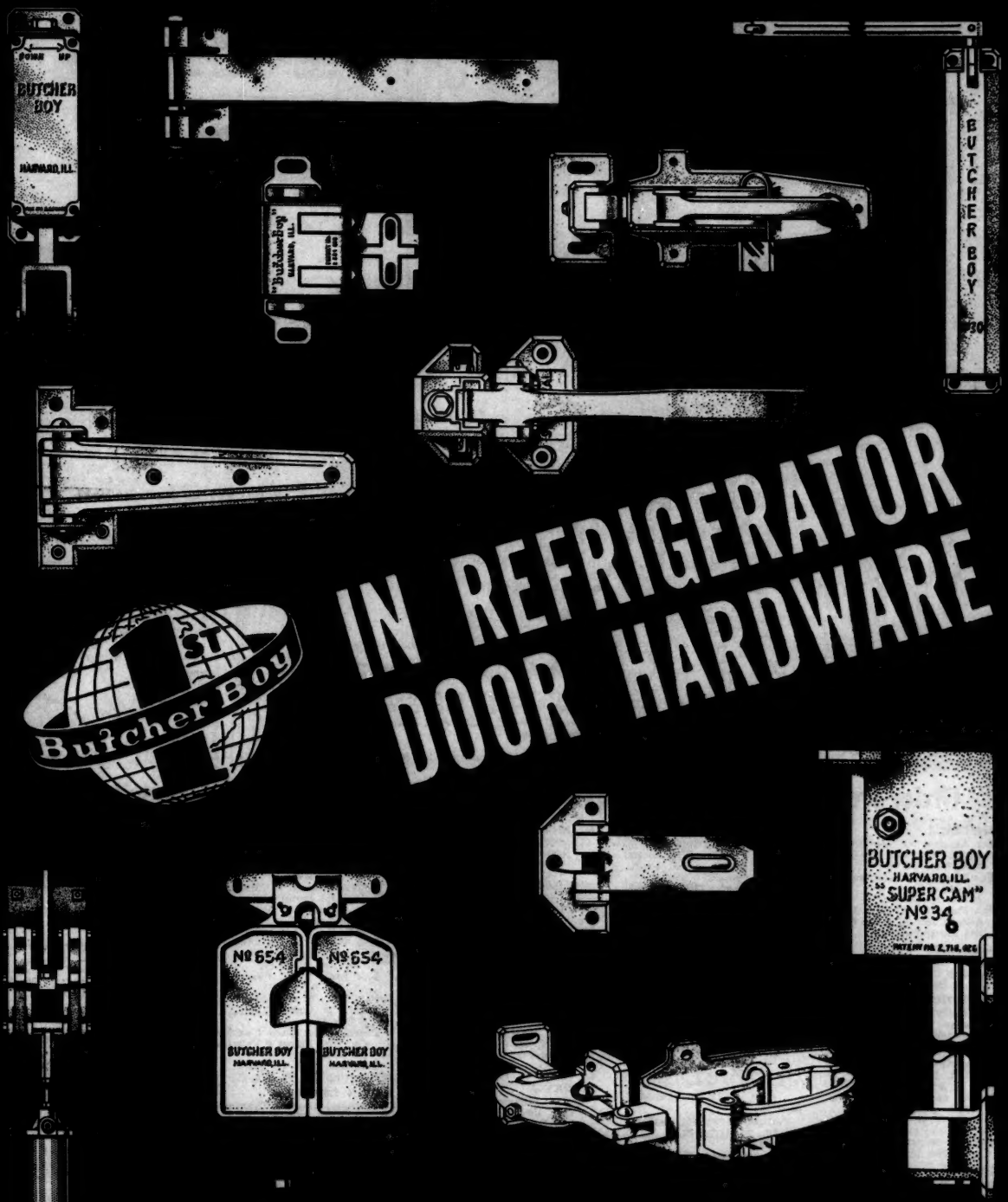

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Industrial Refrigeration

June 1957

Now in its 66th Year of Publication

Number 6

Vol. 132

J. F. NICKERSON, FOUNDER

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The Cover:

These three Worthington centrifugal multi-stage water chilling compressors located in the sub-basement main equipment room will produce 2250 tons of refrigeration for the District of Columbia Hospital Center, and can be increased to 3000 tons of refrigeration to cover future expansion. They are driven through speed increasing gears by three 800 hp 4160 volt synchronous motors. A 4160 volt line runs to the motors directly. See story starting on page 15.

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What's New

MACHINERY
APPLIANCES • PROCESSES

New Monometers

Dwyer Manometer

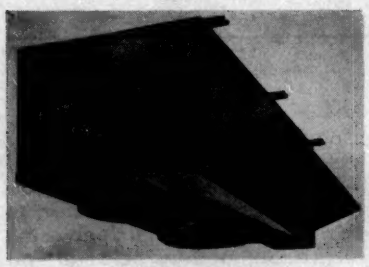
A NEW LINE of low-cost manometers for general use as light pressure and vacuum indicators has been announced by the F. W. Dwyer Mfg. Company of Michigan City, Ind. Because of it's economy, versatility and high degree of accuracy, the manufacturer's Series 1225 manometer is well suited for determining velocity and static pressures, leakage, fan and blower efficiency, resistance through filters, gas pressure and many other measurements. The instruments are now available in three sizes (6, 12 and 18 inch) with either straight or inverted "U" connections for rubber tubing at the top. Double columns are constructed of clear heavy-walled Butyrate plastic tubing. A durable center-mounted fibre scale, dead white with black silk-screened graduates and figures assures good legibility and freedom from parallax error. The face of the scale is protected by a soil-proof lacquer coating and the complete scale assembly is vertically adjustable for precise zeroing.

Heat Trap Coils For Defrosting Storage Rooms

WITT Defrostaire heat trap coils, which automatically defrost fresh meat rooms below 34 F, for food storage, food freezing, ice cream storage, etc., have been introduced by A. H. Witt Co., Los Angeles, Calif., manufacturers of refrigeration coil equipment.

They are gaining wide acceptance for industrial low temperature applications, according to the company. A number of these coils have been furnished for aircraft companies, where temperatures are required to vary from minus 20 F to minus 85 F. Standard units are used with no special type of evaporator necessary to hold these temperatures.

Defrostaire employs a patented heat trap system that takes advantage of the fact that rising warm air can be trapped under a hood and requires only a low cost single pole, double throw time clock for complete automatic defrosting.



Witt Defrostaire Heat Trap Coils

Refrigerated Curtain For Cold Rooms

A REFRIGERATION curtain for dairies and food storage has been announced by Seattle Tent and Awning Company, Seattle, Wash. Called the Rainier Cold: Seal Refrigeration curtain, it is made of 16-ounce Neoprene impregnated Nylon fabric. It is designed for refrigeration doorways, sharp rooms and coolers, passdoors, including refrigeration truck doors. With the Cold Seal curtain installed, it is not necessary to close heavy insulated doors between trips when moving goods in and out of cooler areas. The bottom-weighted curtain separates easily at the pressure of the load going through and quickly closes again when the doorway is cleared. Silvered on the "outside", it reflects heat away from the room. Two plexiglass windows are located at eye level in each pair of curtains to permit full, safe vision through the doorway. Installation is accomplished with plant labor within thirty minutes.

Using Cold:Seal Refrigeration Curtain in doorway of refrigerated room

New Fiberboard Sheeting

THE development of an improved fiberboard sheeting material to make it applicable to a wide range of industrial uses, has been announced by the Industrial Division of the Armstrong Cork Company. The new Armstrong fiberboard sheets, developed through research as a successor to the company's former fiberboard sheet material, have improved characteristics which make the product increasingly acceptable as a lightweight economical material.

Among the uses for the Fiberboard sheets are dividers for compartments of room air-conditioners, a job once performed by metal and plastic panels, and many other applications. In effect, a dimensionally sized panel of fiberboard sheeting can be used in any manufacturing operation where a rigid metal panel or plastic sheet is being used to separate unit components. In many cases, it has been found that the light weight of the material helps to reduce the total weight of the end product.

Light in weight and low in initial cost, fiberboard sheets offer further saving in ease of fabrication. For example, the material can be notched, scored, or die-cut accurately and cleanly to any desired shape. Steel-rule dies are usually all that are required for any die-cutting operation.

Self-Sealing Pipe Fitting

DRIP leaks of pipe connections in industrial plant or other domestic use, are eliminated with this thin nut-like metal fitting introduced by the Tru-Seal Division of Flick-Reedy Corp., Melrose Park, Ill., It seals instantly and permanently when threaded onto a standard pipe connection, says the announcement. Sealing is accomplished by a dry, milky-white circular insert of Teflon plastic, which is resistant to temperature and chemically inert.

Tru-Seal pipe fitting screwed on standard pipe by hand

This means it can be used in lines carrying oil, water, gas, air, steam, chemical fluids or edible liquids and beverages. It holds seal under ultimate pressures or 10,000 psi. (700 times greater than normal atmospheric pressure), and temperatures from minus 200 F to plus 500 F. Item is trade named Tru-Seal fitting.

New Compressor Valves Employ Ball-Check Principle

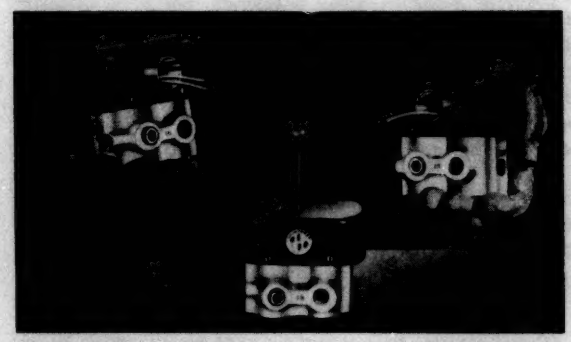
FOLLOWING announcement in the April issue of Industrial Refrigeration under "Manufacturers News", of a new compressor valve being marketed, a number of inquiries were received concerning the principles upon which the valve operates.

Cutaway of Ball valve, showing principles of operation, path of gases, and one method of fastening the assembly to compressors.

The above illustration is perhaps the best explanation. The valve operates on the simple ball-check principle found in ordinary piping systems, except perhaps with the addition of small springs which load each ball in the valve. The illustration depicts one type of valve manufactured by the Ball Valve Company of Chanute, Kansas, and Kansas City, Missouri. These valves are made for many popular lines of compressors.

New 4-Way "Quick Dump" Valves

DEVELOPMENT of three new "Quick-Dump" control valves, for fast, smooth operation of double-action cylinders, has been announced by Humphrey Products Division, General Gas Light Company, Kalamazoo, Mich. The new valves are four-way, five-port models, utilizing the same exclusive Humphrey "Quick-Dump" valving mechanism employed in all other valves in this line.

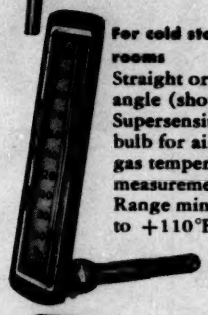


New Quick-Dump Control Valves developed by Humphrey Products Div. General Gas Light Company

Two of the new valves are electrically operated and the third is equipped with hand lever. The electric valves do not employ solenoids, but, instead, have new type electro-magnetic armatures, claimed to be very fast, powerful, and durable. Armature travel in actuating the valve is only .022 in. This short throw, the manufacturer explains, eliminates hammering action and reduces wear.

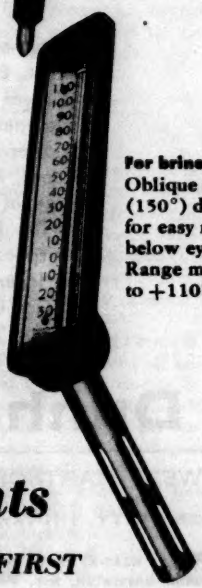
Taylor Industrial Thermometers are Accurate Rugged and 3 times Easier to Read!

For insulated brine or ammonia lines
Insulated stem, straight (shown) or 90° angle. Range minus 40° to +110°F.



For cold storage rooms
Straight or 90° angle (shown). Supersensitive bulb for air and gas temperature measurement. Range minus 40° to +110°F.

For small diameter brine or ammonia lines
½" fixed thread connection. Stem extends 1" below the thread. Range minus 20° to +120°F.



For brine tanks
Oblique angle (150°) designed for easy reading below eye level. Range minus 40° to +110°F.

There's a Taylor Thermometer for practically every temperature measuring problem. Ask your Taylor Field Engineer, or write for **Catalog 300.**

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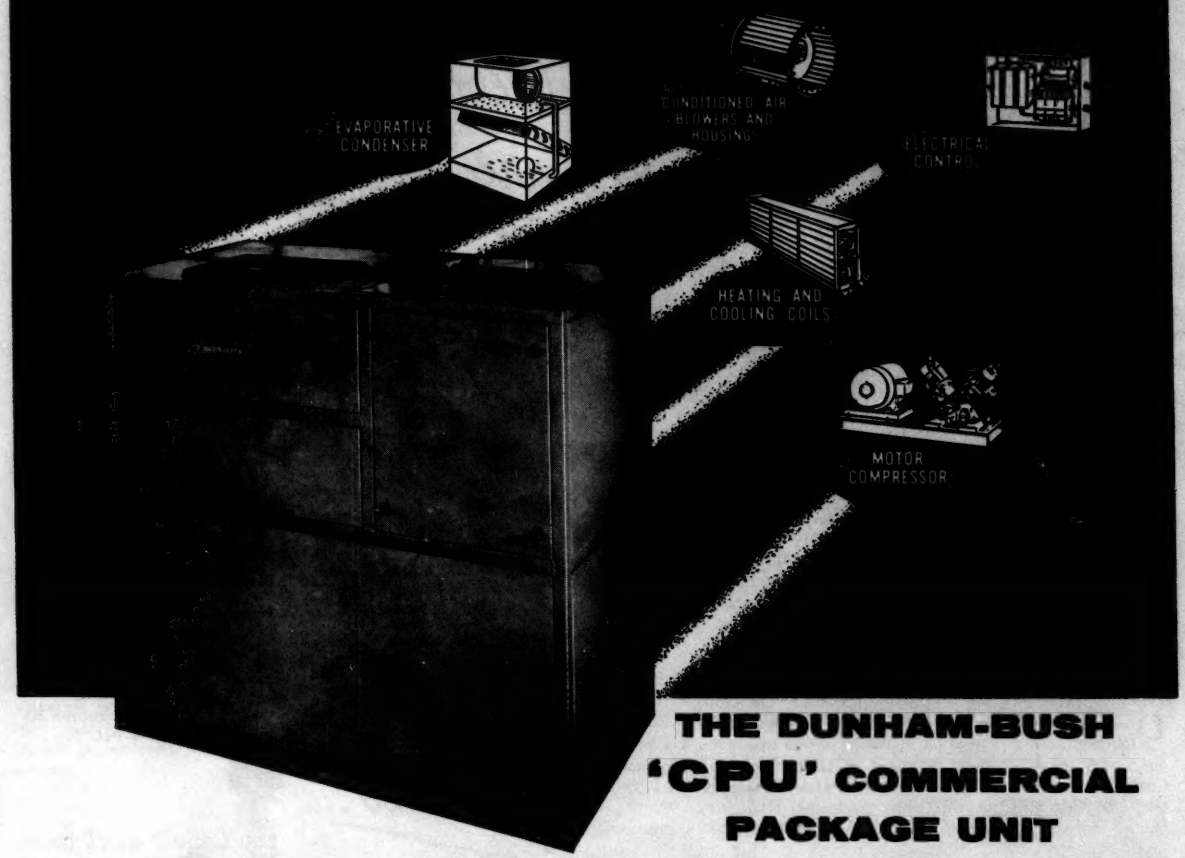

THE DUNHAM-BUSH 'CPU' COMMERCIAL PACKAGE UNIT

This pre-engineered Dunham-Bush unit is a complete air conditioning ***system*** housed in one cabinet. Each unit is ***entirely self-contained*** . . . with evaporator, compressor, evaporative condenser and pump, fans, motors, piping and controls . . . all ***pre-engineered*** to provide peak operating performance at minimum operating cost. Installation requires only connection of power supply to control panel, connection of water make-up line and necessary duct connections. All units are run in and tested before shipment and are shipped with a holding charge of Freon.

The Dunham-Bush 'CPU' unit features patented high efficiency Inner-Fin® cooling coils; slow speed compressors specially selected for quiet operation; and forced-draft, blow-through type Inner-Fin evaporative condenser. Available in 10, 15, 20, 30 and 40 Ton models.

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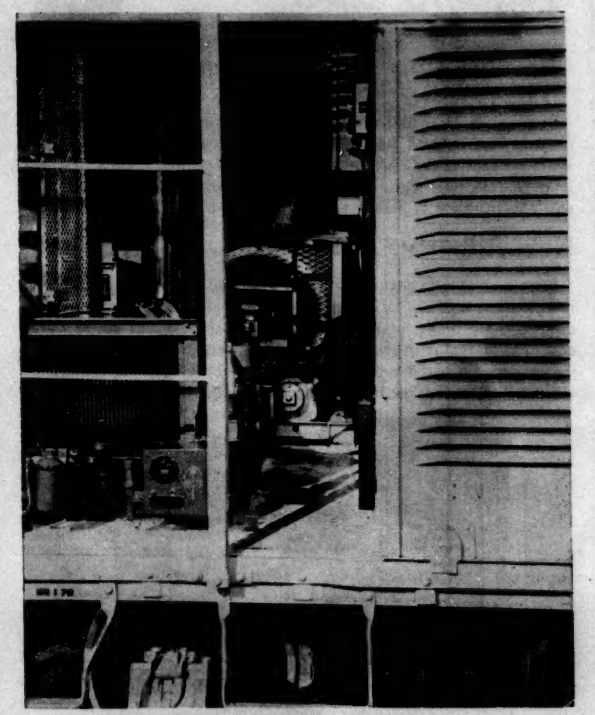
Robot Unit Announced by Carrier For Refrigerated Railroad Cars

A COMPACT new railway refrigeration unit that can "think for itself" on long, untended cross-country hauls has been developed by Carrier Corporation for low cost transport of refrigerated foods. The new unit, a product of five years of research by Carrier engineers, features compactness, high capacity with low power requirements, automatic defrosting and heating as well as cooling.

Loren Fletcher, vice president and general manager of Carrier's Allied Products Division, said the new product weighs 600 pounds less than previous models, and cuts down size and cost, while increasing efficiency and dependability. Automatic equipment controls both heating and cooling, makes the unit completely maintenance-free on transcontinental runs. Another Carrier innovation is automatic defrosting which provides for quick removal of ice from cooling coils without disturbing the cargo space temperature.

The refrigerating capacity is sufficient to provide temperatures down to minus 10 F under all conditions encountered within the continental United States. It uses a 12-½ kilowatt diesel power supply. Heating also is provided in case other than frozen food is to be transported. The versatile heating-cooling system also works to keep temperatures constant despite outside changes of climate met in long-distance runs.

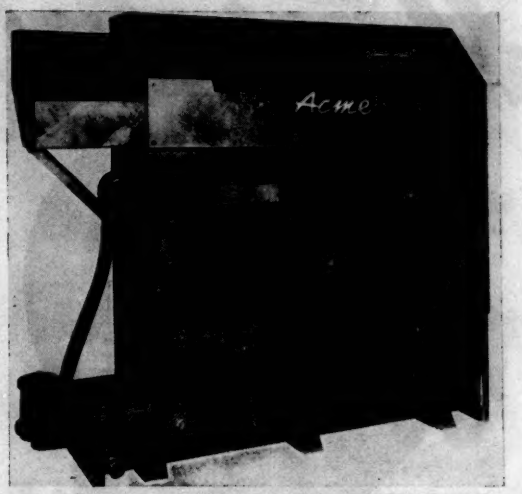
The unit includes two compressors, each capable of operating the system by itself. Both are used when high loads are imposed. Field tests have shown that one compressor could carry a load safely across the country. By alternating the compressors, longer life is assured and a desired constant load is provided to the power plant. Reduced power requirements allow use of a 12-½ kilowatt diesel engine alternator set which takes up less car space. Carrier engineers found that the 12-½ kilowatt power plant was adequate for operating the refrigeration unit under all weather conditions encountered in this country. All operations are controlled by automatic devices.



Carrier Corporation's Refrigerating Unit is shown installed in a Pacific Fruit Express car. The system weighs 600 pounds less than previous equipment and requires less space and power. Below is the Diesel unit which powers the refrigeration system above. Controls for the unit are mounted on the right wall.

Coil Design Adds Efficiency to New ACME Evaporative Condensers

A NEW series of Acme "Flow-Mizer" evaporative condensers, with capacities up to 200 tons and incorporating zig-zag cross-sectional coil spacing with phenolic spacers, has been announced by Acme Industries, Inc., Jackson, Mich. The new units offer maximum condensing efficiency with 97 percent water savings in air conditioning and inudstrial liquid cooling, according to the manufacturer.



This new series of "Flow-Mizer" evaporative condensers are being marketed by ACME Industries

Improved turbulence and heat transfer is achieved with staggered, cross-sectional spacing of the tubes in the new units. Water moving downward and air moving upward travel a longer, zig-zag path through the coil. Falling spray water is kept in longer contact with the tubes in all the new Acme evaporative condensers because coils are pitched to form a continuous, zig-zag slope longitudinally. This sloping also allows the refrigerant to drain more rapidly.

As in previous models of Acme's famous "Flow-Mizer" units, longer life is assured with hot-dip galvanizing after fabrication. Galvanizing a full, .004 inches thick on both sides of the metal is put on after assembly of the sections. Water treatment is simplified with the external sump, as is servicing of the sediment screen and draining the units. Easy access, for inspection and servicing of spray nozzles, eliminator packs and the coil, is assured with Acme's big, full-width inspection panels.

Automatic Treatment for Water Used in Refrigeration

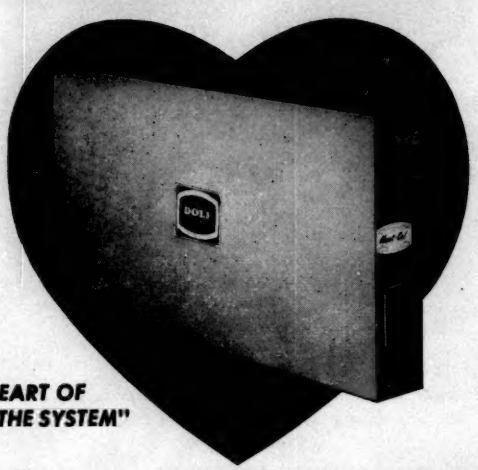
HYDROTROL is a new automatic water treatment feeder and bleed off regulator for control of mineral scale, corrosion, slime and algae in cooling water used for refrigeration, air conditioning, Diesel engines and other cooling needs. Introduced by Heller Laboratories Inc., Leonia, N. J. It regulates water treatment according to the amout of water evaporated from a cooling water system instead of by constant volume chemical feed and bleed off methods commonly used heretofore.

Heretofore, with constant volume methods of chemical feed and bleed off, because the amount of feed and bleed off adjusted for could only approximate the actual load requirements, it was necessary to make frequent water analyses and compensating adjustments of feed and bleed off in order to correct for the resulting divergence of treatment from desired conditions. Because Hydrotrol electrically "locks in" the amount of chemical feed and bleed off with requirements (actuated by the amount of water evaporated or the actual load on the system), there is no "drift" of treatment strength or mineral concentration.

Due to this improved control, Hydrotrol now makes possible perfect regulation of cooling water treatment without continual

DEFROST PROBLEMS?
Here's the ANSWER!...

ELECTRIC
Heat-Cel



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Automatic DEFROST
FOR NEW OR EXISTING INSTALLATIONS

- Heat for re-evaporation supplied by low wattage, long life ELECTRIC HEATER.
- Positive, consistent, economical.
- Performs efficiently in any ambient, regardless of location or season.
- Independent of compressor operating time or type (air or water cooled).
- Solution temperature automatically maintained by thermostat.
- Adjustable for individual operating conditions.
- No special controls needed for winter-time operation.
- Higher wattage elements available for extreme conditions.
- Heater replaceable in the field.
- Patented DOLE VACUUM principle insures faster heat transfer for quicker defrosting . . . convenient "plate" design allows flat-against-wall mounting.

Write for Engineering Catalog DBE.

Defrosting "Kit" includes Heat-Cel and Accessory Package containing all necessary controls*

* *Approved by Underwriters Laboratories*

Maximum Refrigeration Efficiency
DOLE
THE Oil LINE

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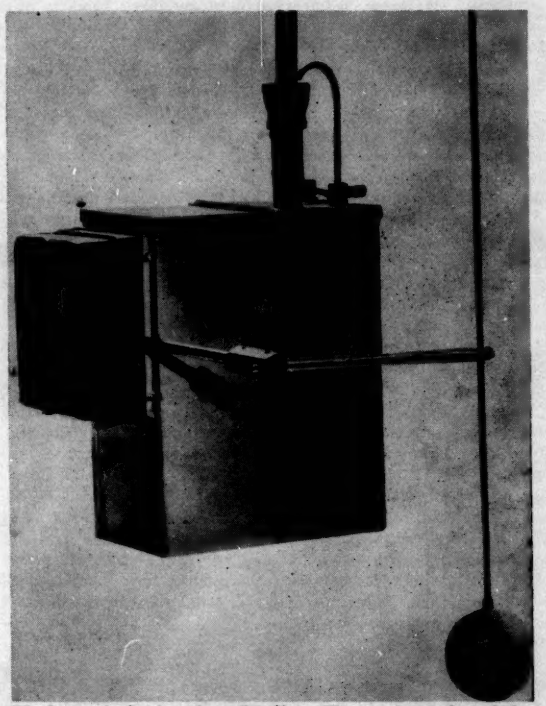
[illegible]: Dole Refrigerating Products Limited
44 Elgin Street, Brantford, Ontario

water analyses, compensating adjustments and close supervision or attention by a water treatment specialist. Where necessary, Heller Laboratories will furnish new users equipment, free of charge, with fresh water analyses and recommendations for proper operation and treatment, including types and amounts of chemicals to use for the control of mineral scale, corrosion, slime and algae.



Hydrotrol device for Cooling Water introduced by Heller Laboratories Inc.

It is simple to install and operate. Complete instructions are furnished. The control housing is of heavy cast aluminum, control shafts are of stainless steel and a heavy seamless copper control float is used. Internal electrical elements are of the best materials and construction available.

New Adhesive Label

LAYKOLD INSULATION ADHESIVE, designed to adhere vapor seal membranes and insulation materials for cold insulation construction, is now being marketed in a new label shown below. The new design features greater emphasis on readability and product information, as compared to old label on the left. New chevron hallmark coupled with sharply-contrasting colors of red and

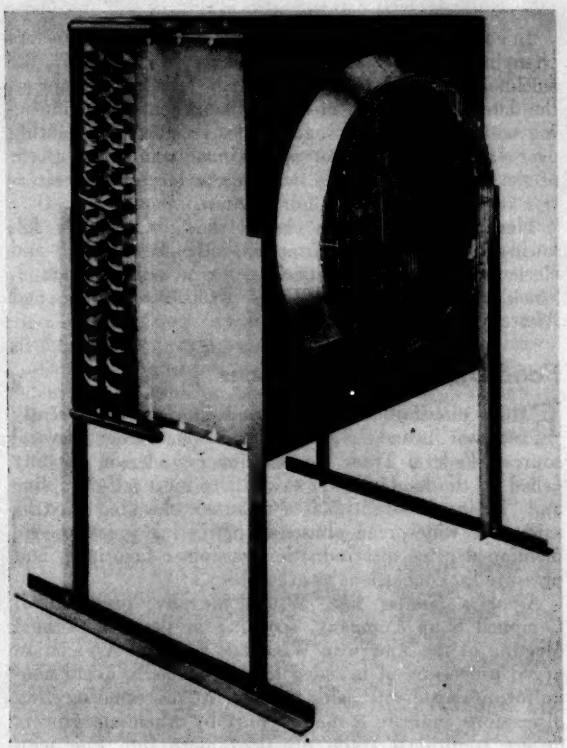
New versus old label for Laykold Insulation Adhesive.

blue on a white background serve to identify American Bitumuls & Asphalt Co., marketers of Laykold emulsions, more closely with its parent organization, Standard Oil Company of California, and its full line of petroleum products.

New Air-Cooled Condenser

A NEW Recold product, the "Dricon" air-cooled condenser featuring an exclusive balanced circuiting, has been released to the market by the Recold Corporation 7250 East Slauson, Los Angeles 22, Calif.

Recold's exclusive circuiting greatly increases the efficiency of a condenser coil. Ordinarily air cooled condensers are headered across the top and bottom, which means that there is a greater temperature difference between air and refrigerant at the first row of coils than the last. Consequently the first row will tend to fill up with liquid while the last row has much less capacity. By crossing the circuits, Recold balances the amount of work done by each circuit, thereby increasing the efficiency of the coil.



New Recold "Dricon" air-cooled condenser released to the market by the Recold Corp., Los Angeles.

Other outstanding features of Recold's new "Dricon" air cooled condenser include the adjustable angle iron stand furnished on all units, the large slow-speed belt-driven fans, galvanized housing, copper tube aluminum fin coils, strong fan guard, precision ground shaft, self-aligning ball bearings, motor located inside unit for weather protection.

New Giant Battery

A NEW battery, the TG Exide-Ironclad Giant, was introduced recently at a press conference in New York, described as a unit which packs significantly more storage battery power in a given space, an increase of 44 percent in rated capacity of Exide-Ironclad motive power batteries; result of 3½ years of research and development. Advantages include more power in similar units for material handling trucks, etc., contributing to smaller, more maneuverable traction units for efficient space savings in plants, warehouses, etc. This pattern extends to floor areas of battery departments where present space is better utilized in these compact units. New batteries also extend rated capacity from 50 amp-hrs to 72 amp-hrs per positive plate. Literature on this new battery is available; also a 36-page handsomely printed brochure on Exide engineering procedures and developments.

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AMMONIA COMPONENTS
FROM MANUFACTURER TO CONTRACTOR

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CONDENSERS
Evaporator, Double Pipe, Shell and Tube
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FLAKE ICE MAKERS
1 to 10 tons
RECEIVERS
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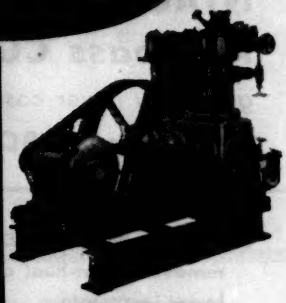
Fabricated to order



MODEL D IN SIZES
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HOWE'S custom-order fabrication shop is especially set up to produce quality ammonia components that meet exact industry requirements. Pressure vessels are built to ASME code standards. Shop flexibility gives you volume quantity prices on small quantity purchases, along with deliveries that meet your schedules. Consult Howe today — no obligation.

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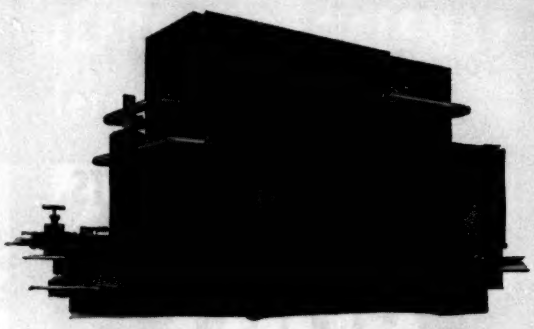

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***Aeropass* CONDENSER**
gives you lower cost refrigeration,
saves you ***LABOR,*** *Power, Water*

- **Because Niagara "Duopass" pre-cooling removes super-heat and gas condenses at lower temperature.**
- **Because the system is automatically purged of oil.**
- **Because the new design improves the heat transfer to the out-door air by evaporation.**
- **Because these features keep the condenser working for long life with "new plant" efficiency... always full capacity.**
- **Because you save 95% of cooling water cost.**

You save labor in upkeep. With full access to all parts and interior piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 90 to 240 tons. No other condensing method gives you so much saving in money and trouble.

Write for Niagara Bulletin 131.

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District Engineers in Principal Cities

NIAGARA *Over 40 Years' Service in Industrial Air Engineering*

PRESS BRIEFS

City Products Shows Increased Sales

THE City Products Corporation's net sales for 1956 were $93,190,978, as compared with $81,262,553 in 1955, and the 1956 earnings were $3.68 per share, as compared with $3.30 in 1955. This statement was made by William J. Sinek, Chairman, at the annual stockholders' meeting held April 18, 1957, Cleveland, Ohio. He also said present indications are that sales and net earnings for the current fiscal year will show satisfactory increases.

In conformity with the action of the Board of Directors changing the fiscal year to commence April 1, 1957, the stockholders voted to fix the fourth Tuesday in June as the date of the annual meeting of stockholders, commencing with the 1958 meeting. Proxies received representing over 1,100,000 shares, or approximately ninety per cent of the outstanding shares, will be the largest representation in the history of the Corporation.

Eleven Directors were elected, and immediately following the stockholders' meeting, the Board met and elected officers for the coming year, with William J. Sinek as Chairman and Chief Executive Officer and Andrew R. Carlson as President.

Food Distribution Practices

FOOD distribution practices and policies have recently received some close examinations from several sources. Federal Trade Commissioner Anderson recently called on the food industry to practice more self-discipline and "business morality" as a means of checking what he said were widespread abuses in marketing practices. He mentioned price discrimination, customer favoritism and pressure for concessions as examples.

Along a similar line, W. B. Murphy, president of Campbell Soup Company, speaking at the 51st Annual Meeting of the American Wholesale Grocers' Association urged processors of branded food products to avoid non-uniform "expedient" sales policies. At the same meeting discussions indicate a major effort by wholesale grocers to get traditional trade practices more into line with current economic conditions. Certain price differentials, transportation policies by food manufacturers and a streamlining of manufacturers' sales programs to distributors.—NARW Quick Sheet

Spain Approves Cold Storage System

THE Formation of a national cold storage system in Spain has been approved by the Government. All applications for permission to install cold-storage facilities must be submitted to and be approved by the Ministry of Industry. Successful applicants will receive technical and economic assistance from the National Institute of Industry, a government corporation engaged in a variety of industrial activities throughout Spain.

The system was approved through a decree which further provides that all such approved projects will be considered of "national interest" and will therefore be given priorities and concessions to facilitate plant construction and operation.

Cold storage facilities are very limited in Spain and the need is so great that it is quite apparent that the additional facilities contemplated by this measure will be of considerable economic value and benefit to both suppliers and consumers of perishable products.

Selling Eggs Through Vending Machines

SELLING eggs through vending machines is being pioneered by Ernest W. Huppert, largest poultryman in the area of Rochester, N. Y. One machine is set up in front of his house and one outside the Monterey Diner in Rochester. The machines are similar to milk vending devices, which now are in wide use, and they are electrically heated in winter and refrigerated in warm weather. The eggs are always fresh laid, since Huppert has 7,000 hens and various other outlets for the product.

Cornell University sparked the vending idea by ordering five machines and placing them with poultrymen on an experimental basis. Now the devices are being mass produced. The machines dispense two sizes, medium and large, and Huppert says about one-third of them are sold between 8 p.m. and 8 a.m.

Washington Dairies Merge

THE SALE of all assets of the Walla Walla Dairymen's Association to the Dairy Co-Operative Association of Portland, Oregon was approved in Superior Court recently. Dairy Co-Operative submitted a bid of $85,000 for the business assets at public auction March 29. It was the only bid received. The dairymen's association was sold as a going business on a lump-sum bid for all assets, route lists and good will of the firm. An order for dissolution of the association was signed in Superior Court on February 28 following approval by stockholders of the move. Dairy Co-Operative operates processing plants in Portland, Salem and Hermiston and has distribution stations at Pendleton, Hood River, The Dalles, Lebanon, Oregon City, Hillsboro and Vancouver, Camas and now Walla Walla in Washington.

Tardy Employee Prevents Explosion in Ice Plant

A TARDY employee and a fire probably saved the Broadway Ice Co. plant, Tampa, Fla., and surrounding buildings from destruction by dynamite. Walter Ross, an employee, was an hour late to work. In the meantime, a small fire broke out in the cement structure's engine room. After firemen doused the minor blaze, owner Frank Vacanti and an electrician checked the plant wiring. They found 113 sticks of dynamite linked by wire and reposing in holes drilled in the cement walls.

Ross's customary first chore was to close a switch that started the ice-making machinery. Investigators said that if he had done so, the dynamite would have exploded. Authorities found no clues as to who placed the dynamite or the motive.

Army Serves Atomic Foods

THE ARMY served some Congress members and newsmen at Washington on May 9 with a tasty luncheon made from food treated by atomic radiation to preserve it against spoilage. The food was two months old.

A little earlier some of the newsmen sampled a can of black-currant jelly made in England in 1911 and left by Sir Robert Scott in a food cache in Antarctica in 1912. The can was found last year by members of the Navy's deep freeze II expedition. Although the methods of preservation were different, irradiation vs 45 years of deep freeze, both foods were savory.

The exposure of the food to radiation (using either electronic rays from a machine or gamma rays from the by-products of power reactors) appeared to change their flavor little or none. This was true of shrimp, chicken, potatoes, broccoli, salad, strawberry dessert and rolls.

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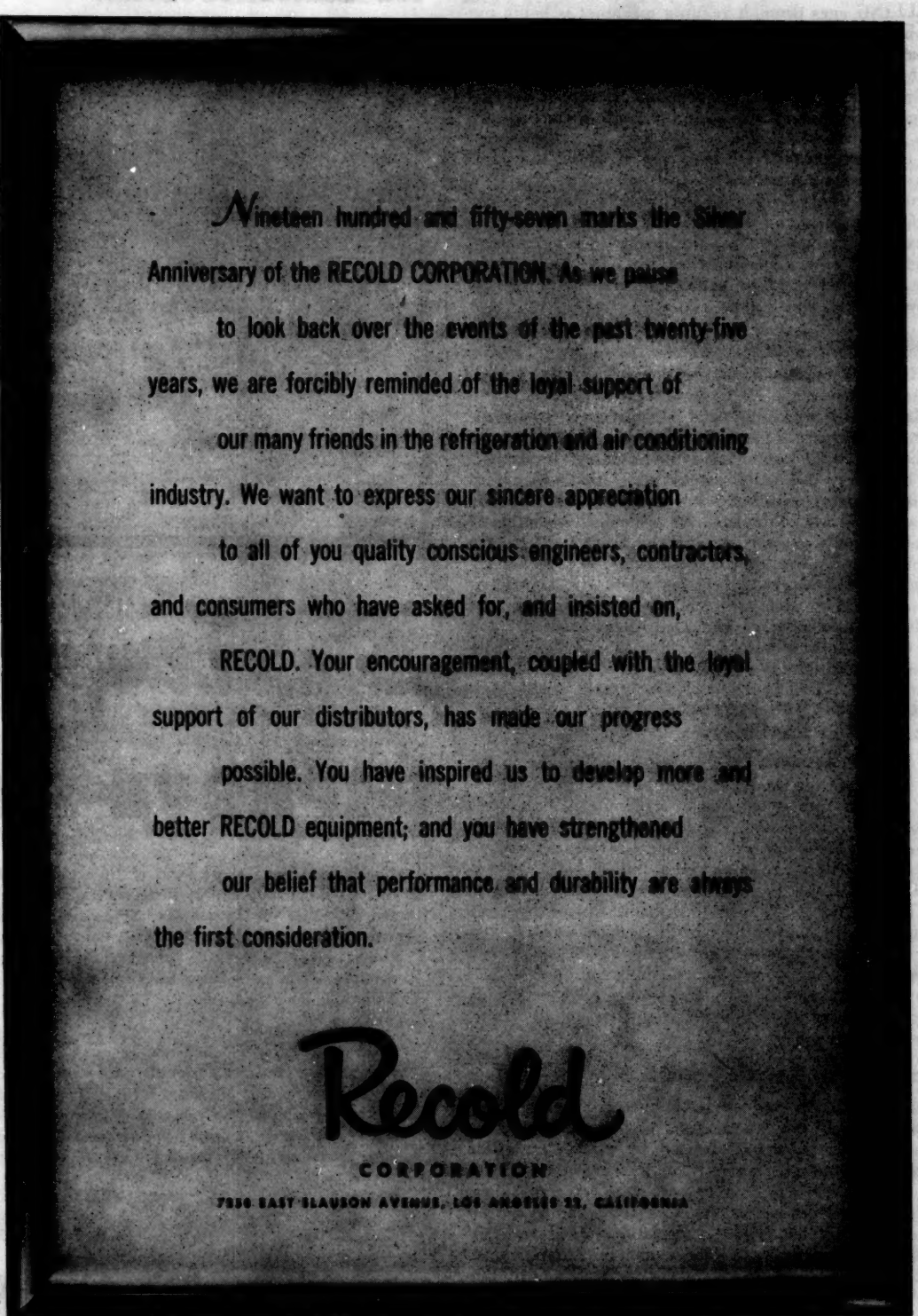
Nineteen hundred and fifty-seven marks the Silver Anniversary of the RECOLD CORPORATION. As we pause to look back over the events of the past twenty-five years, we are forcibly reminded of the loyal support of our many friends in the refrigeration and air conditioning industry. We want to express our sincere appreciation to all of you quality conscious engineers, contractors, and consumers who have asked for, and insisted on, RECOLD. Your encouragement, coupled with the loyal support of our distributors, has made our progress possible. You have inspired us to develop more and better RECOLD equipment; and you have strengthened our belief that performance and durability are always the first consideration.
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CORPORATION
7930 EAST SLAUSON AVENUE, LOS ANGELES 22, CALIFORNIA

Formerly REFRIGERATION ENGINEERING, INC.

In the Spotlight

COMBINING their resources and submerging their identities, three of Washington hospitals have been absorbed by a new corporation to form the District of Columbia Hospital Center, the largest completely air conditioned hospital in the nation's capital. Cooling capacity of 2,250 tons is required. Covering almost fifty acres, the center consists of three main buildings. Cooling is furnished by a central chilled water refrigeration plant located in the sub-basement. For description of the air conditioning, see article starting page 15.

THE IMPORTANCE of maintaining the quality of frozen foods is a subject of much concern to the frozen food industry and one to which a lot of time and thought has been given. Results of a seven-year study conducted by the Western Utilization Research Branch of the U.S. Department of Agriculture on the ability of frozen foods to withstand storage temperatures higher than zero have now been made available. A report on this study, page 17, contains a number of major considerations that are significant to further future programs.

REINFORCED Plastic for truck bodies gives indication of having a promising future. This is particularly true of refrigerated transportation. The use of this material involves the molding of complete bodies and tanks in one piece in one molding operation, using a metal tie process in which the outer plastic layers are fused to an inner core of insulating material. This method is described and the advantages of such construction, as well as its disadvantages, are listed in the article on page 28.

THE ASRE Chicago Chapter observed its fortieth anniversary with special presentation to two surviving members of the original sixteen charter members. At this regular monthly session of the chapter, a talk was given on The Time Temperature Tolerance of Frozen Foods, by Ed Lowe, Western Regional Laboratory USAA, Albany, California. For other details of this meeting see article, page 20.

MUTUAL PROBLEMS of the warehousing and frozen food industries were discussed at a joint meeting of the warehousing committee of the frozen food packers and the warehouse operations committee of the National Association of Refrigerated Warehouses. For details of the discussion see page 22.

THE DISTRIBUTION and marketing of frozen fish is the subject of a study prepared by The Fish & Wildlife Service, U. S. Department of the Interior. It emphasizes the importance of keeping the product under adequate refrigeration at all times. The various methods of refrigerated transportation are reviewed including refrigerator cars, refrigerated trucks, cargo ships and airplanes. For the high points of this study, see article on page 25.

CLOUDY AND Opaque ice has been a problem among ice making plants due to mineral content of the water used. The remedy is deionization, which is in widespread use in many industries. This deionization process is discussed in a bulletin issued by the Bureau of Engineering Research of The University of Texas, which is reviewed in article on page 29.

PRIVATE WAREHOUSING of refrigerated commodities by chain grocers, restaurants, frozen food packers, and others has accounted in part for the reduction in public cold storage occupancy. Nationwide service requirements in connection with procurement or marketing and often both, has led to the increase in private refrigerated storage. To combat this trend a number of leading independent cold storage concerns have formed a service association known as TARS. Learn how this plan will function by referring to article on page 30.

MANY PRACTICAL engineers apparently feel that they owe it to themselves and their employers to continue self education. At least that is the impression received from the registration and attendance at the recent Midwest Regional Educational Conference, NAPRE, held at Milwaukee, Wisc. (See a detailed report on page 34). Operating efficiency and maintenance for safety and economy's sake were principal topics. Engineers gave their week end for education, and many employers assisted with travel expense.

TRUCK transportation of frozen foods and other commodities calling for refrigeration has problems, including varying requirements for different commodities. The refrigerating mediums now in use are discussed, with their advantages and faults. See review of Bulletin issued by the Agricultural Marketing Service, page 23.

FOOD consumers in the United States now number 170 million. And every 12 seconds sees a net gain of one customer. With the population increasing at an annual rate of about 1.8 percent, the number of mouths to feed will jump about three million in the next 12 months. Population in 1975 is forecast at 210 to 220 million.

Jenni Genetron says:

For refrigerants that are Super-Dry

Always be sure to specify...

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See Your Wholesaler

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

General view of the District of Columbia Hospital Center, whose three main buildings will cover almost 50 acres.

New Hospital in Nation's Capital Completely Air Conditioned Medical Center

THE DISTRICT of Columbia Hospital Center with 812 beds, 14 operating rooms and 36 treatment rooms serving surgical, medical, obstetric and psychiatric patients will be the largest completely air conditioned hospital in the nation's capital when it is completed this summer.

Covering almost 50 acres, the center consists of three main buildings: the 812 bed hospital which is designed to allow for future expansion to 1200 beds; a nurses' home adjoining the hospital will accommodate 50 graduate nurses and 250 student nurses (a nursing school, with a 310 seat auditorium for lectures and hospital activities, is also located in this building. The nurses' home will eventually have its own 300 ton separate air conditioning system); and a garage for ambulances and other hospital vehicles will be provided.

The 812 beds will be distributed over five nursing floors. The out-patient department will have facilities to take care of 400 patients daily with normal follow-up service. Quarters for resident physicians and interns will be provided on the sixth floor.

Cooling

Cooling for the center is accomplished by a central chilled water refrigeration plant located in the sub-basement main equipment room. Rated at 2250 tons, the plant utilizes three giant Worthington centrifugal multi-stage water chilling compressor units. Each unit is capable of producing 750 tons of refrigeration when delivering 1500 gallons of chilled water at a temperature of 42° F. A. total of 11,250 gallons of chilled and condenser water is circulated through the system every minute.

The compressors are driven through speed increasing gears by three 800 hp 4160 volt synchronous motors. The reason and advantage of using synchronous motors is that, by virtue of their construction, they will improve the power factor on the line. The size and cost of the required switch-gear and wiring was reduced considerably by taking advantage of the available high voltage—4160 volts.

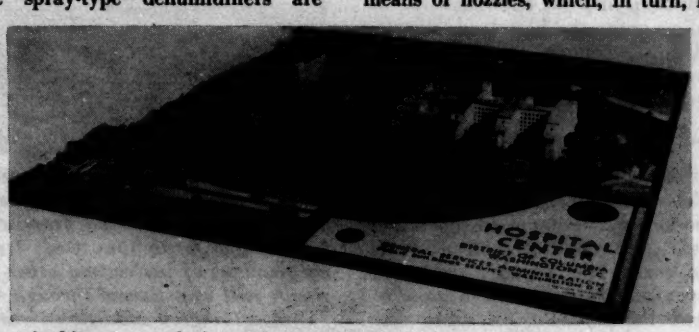
A flow of 350,000 cubic feet of conditioned air per minute is required to cool the hospital's main building. Seventeen Worthington surface spray-type dehumidifiers are used to pre-condition the air which is delivered throughout the building by three separate systems:

(a) High pressure perimeter air system
(b) Low pressure interior air system
(c) Operating room system

Spray type dehumidifiers were utilized in order to maintain, more closely, humidity control the year round. Other advantages include better heat transfer efficiency and smaller space requirements.

High Pressure System

Conditioned primary air at high pressure (7-10" w.g.) is delivered at 50 F wet bulb through more than two miles of round spiral lockseam galvanized steel ductwork to 755 Worthington induction circulators. As the air enters the unit, its pressure energy is changed to velocity energy by means of nozzles, which, in turn, in-



Architect's rendering of new hospital center showing layout of Buildings and grounds.

Eleven Worthington reciprocating condensing units will provide cooling requirements for the general kitchen, bakery, refrigerators, frozen food, paraffin storage as well as the drinking water system.

duces the flow of secondary room air through a water coil to the unit plenum. The primary and induced air is mixed and injected to the rooms located around the periphery of the building. The induction circulator coil removes the sensible heat in the room. Ventilation and humidity control is accomplished by means of the primary air. The system is used year round for heating and cooling. The primary advantage to this type system lies in the fact that there are no fans, motors, or other moving parts on the induction circulators, so repair and replacement maintenance is not necessary.

Low Pressure System

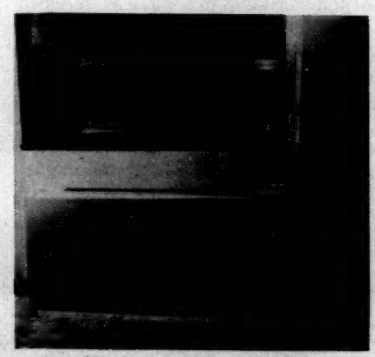
The interior zones of the hospital are cooled by means of a conventional low pressure double duct system. This type system makes each room so served a complete zone automatically controlled for either heating or cooling or as the heat loads dictate. Individual volume ceiling diffusers provide uniform distribution of the conditioned air.

Operating Room System

Because of the danger of inflammable anesthetic gases, the air system for the center's 14 operating rooms uses only 100 percent fresh outside air. The humidity is kept at 55 percent in these areas in order to reduce the possibility of static electricity which could result in a dangerous spark.

In addition to the air conditioning equipment, today's modern hospital also requires refrigeration for many varied uses. Eleven Worthington reciprocating condensing units will provide cooling requirements for the general kitchen refrigerators, frozen food, paraffin storage, bakery refrigerators, morgue cold room as well as the drinking water system.

The anticipated completion this summer covers nearly ten years of planning and negotiating by the general Services Administration and the hospitals which will amalgamate in the new center. These are the Central Dispensary and Emergency Hospital; Garfield Memorial; and Episcopal Eye, Ear and Throat Hospital. They will soon turn their property over to the federal government and receive the deed for this great new hospital center.



A special feature of this perimeter induction system is that no "used" air will be re-circulated from one patient area to another. Only fresh air cleansed of pollen and other irritants will be delivered through the 755 Worthington induction circulators into the individual thermostatically controlled rooms.

Credits

System designed by — Public Buildings Service of the General Services Administration.

Air Conditioning Contractor — William H. Singleton Company, Inc., of Arlington, Virginia.

Plumbing and Heating Contractor —Standard Engineering Company of Washington, D.C.

General Contractor — Standard Construction Company.

Air Conditioning Research Facility For Worthington

A MAJOR air conditioning research facility will be opened in 1957 by The Worthington Corporation. Mathew M. Lawler, vice-president of Worthington's Air Conditioning and Refrigeration Division, said the company's plans for the coming year include completion of an air conditioning research laboratory at the Ampere Works, which were opened this year. This laboratory would be in addition to one in existence at Worthington's Harrison plant.

Lawler said that among the research projects to be taken up would be the development and perfection of a practical, more economical heat pump, which the company hopes to market by 1958. He said that the company had "an increase of some 20 percent in air conditioning sales in 1956. The bulk of this increase was in the industrial and commercial fields. The remainder came in the whole-house residential field."

Worthington abandoned manufacture of room air conditioners two years ago in favor of complete-house systems because it did not believe that room units represented a step toward the ultimate purpose of residential air conditioning.

Lawler predicted that there would be another 20 to 25 percent increase in air conditioning sales in 1957, much of it in the whole-house air conditioning. "The biggest deterrent today to rapid growth in this fertile field," he said, "is the lack of aggressive, creative manpower to sell the equipment. As soon as this manpower is educated and trained, the dam will burst on the whole-house air conditioning."

The Importance of

Maintaining the Quality of Frozen Foods

M. J. COPLEY

U. S. Dept. of Agriculture
Western Utilization Research Branch

Photo by
Orange State Processing Corp.
Lakeland, Fla.

A topic of major interest at the frozen food convention in 1956 was a report on the results obtained by the Wisconsin Alumni Research Foundation on a broad survey of the nutritive value of frozen foods. A review of this report was published in the July 1956 INDUSTRIAL REFRIGERATION. The accompanying paper, based on report on time-temperature tolerance of frozen foods, presents a different aspect of frozen food quality, complementary to the other, and deeply significant to further progress, as indicated by the marvelous achievements of last twenty-five years.

YOU have heard detailed results from our laboratory study of frozen fruits, vegetables, and several poultry and precooked products, I propose to summarize this work, point out implications, and tell what I think is the significance of all this to you and your business.

The frozen foods industry has had to contend with certain difficulties from its earliest days. The frozen products, wonderfully good though they usually were, too often reached the consumer badly deteriorated in appearance, flavor, or texture. Unfortunately this kind of bad advertising still happens often enough to cost the industry customers. If you receive one open complaint that the quality of the food is not what it should be, you can be sure many other people whom you never heard of have lost interest in the product and are not buying it any more.

Let me make it clear that I am talking about the instances of poor, unattractive quality that we sometimes encounter — the brown peach slices, liver-gray strawberries, olive-drab snap beans, grayish-brown cauliflower, rancid chicken or turkey, curdled white sauce or gravy. What in the world can have happened to these products that we know can be so excellent?

To put it bluntly, those defective products have been abused. Whether the mishandling was the result of ignorance, carelessness, accident, cutting corners to meet a price, or simply too much pressure on inadequate equipment, the result has been the same — disastrous.

The production and distribution of frozen foods is an exacting job. The product has a wonderful memory for everything that happens to it, good and bad. It remembers the extra care, the good treatment, and it most certainly remembers every bit of abuse. Any one of the people along the whole chain can ruin the product, all by himself. But the same ruin will follow just as surely from an accumulation of minor bad experiences.

Review of paper presented at annual Frozen Food Convention held at Miami Beach, Fla.

What is a Bad Experience?

The crucial question is just how do you define "a bad experience" in terms of exact times and temperatures, for each of the important frozen foods? That question is the one our research staff set out to answer several years ago.

Our primary aim was to find out exactly what happens to the important quality factors in frozen foods *after* they have been packed and frozen, using as wide a range of time-temperature experiences as they might encounter in distribution. At the same time, though, we wanted to find explanations for differences in the behavior of supposedly similar products. Consequently, with the hearty cooperation of numerous packers, we got our samples from all of the important growing areas for each of the fruits and vegetables we have worked with. We repeated tests on samples from the same growing area in two or three successive seasons. We got samples from plants employing different processing and freezing methods. Altogether, with the cooperation of your two associations, the Refrigeration Research Foundation, and numerous individual packing plants, we have procured and put under test more than 50,000 separate packages of various frozen foods. We have continued to receive important technical assistance and counsel from individuals and frozen food associations throughout the course of the work.

To nobody's surprise, we found that damage to product quality can begin right on the farm or in the packing plant. When that happens, you start with a product that is already partly crippled. Nothing that happens to it later is going to heal those wounds—quite the contrary.

Time and Temperature

While there are plenty of other headaches in the operation of this system, the two we are talking about today are the twin troublemakers, time and temperature. They are twins because you must always consider them together. You might put it this way: The higher the temperature, the more damage is done in a given length of time; and, the longer the time, the more damage occurs at a given temperature. Don't just ask, "What is the highest temperature this case of goods has experienced?" Ask instead, "What has been the temperature *history* of this case of goods?"

If frozen foods were always kept in an environment at zero or below we would not have much of a problem. You all know, however, that this is not the case in actual operation of the system. A team of men from the Birds Eye Division of General Foods Corporation made a thorough survey of practices in 1952 and 1953. Most people were shocked to discover how frequently this team had found temperatures not only of

10 or 15F, but of 20, 30, or even 40F. A single package of food goes through many ups and downs of temperature before it is consumed. There are "downs" in the quality of that food, but no "ups."

Frozen products, like people, differ a lot in their reaction to adversity. For instance, under poor conditions orange juice concentrate and some precooked items go downhill rapidly, peas not so fast, raspberries slower yet. Differences in sensitivity because of seasonal or regional variations in the raw material are rather minor, but faulty processing or packaging can have a major effect. Of course if you are responsible for a mixed stock of different frozen foods it is very much as though you were host to an oddly assorted group of people; the entertainment you offer has to be tempered to the one person whose feelings are easily hurt.

Effect of Temperature

Now, something more specific about the effect of temperature. We can summarize it all this way: Any rise in temperature speeds up all the changes in the frozen product. The magnitude of the effect is really astonishing. In a number of the products we have studied, for example, even a 5-degree change anywhere in the range between 0 and 30F makes a big difference—often two- or threefold and sometimes as much as fivefold. Putting it the other way around, that means that if we *reduce* the temperature by 5 degrees it will take from *2 to 5 times as long* for the same change to occur. See what that means in terms of useful marketable life in the product!

What is more, each 5-degree change *multiplies* the effect. If one 5-degree rise speeds up the change 3-fold, 10 degrees will speed it up 9-fold, 15 degrees 27-fold, and so on. Mr. Jansen made a statement this morning that should open the eyes of many a retailer or restaurant chef. "Letting a package of frozen food get up to a temperature of 25 to 30F for just one day" he said, "is worse than using from a pack more than a year old."

Remember, a temperature of zero is itself a compromise, not an impractical and unattainable ideal. Changes would be slower if we maintained minus 10 F, slower yet at minus 20 F. So far our tests have not disclosed measurable changes in two years at minus 20 F. We commonly store reference samples at that temperature for comparison many months later with samples we have purposely abused.

How many people in the industry use the "feel test" to determine whether a package is cold enough? I urge you, do not let them rely on it—it can be seriously misleading. A package of food in the temperature range of 10 to 20 F will feel hard, so you may think it must be all right. As a matter of fact, the quality of that food will be going downhill fast. Use a thermometer!

Now suppose that in spite of everyone's best efforts the temperature of the frozen food does rise several times during the months before it is consumed. Does it matter whether those periods of adversity happen early in the product's history or later? Some people have thought it might make a difference, that an early abuse might somehow set a trigger mechanism, such that even a minor experience later would bring about the explosion that would wreck the product. We do not find any such effect. Also, with only some minor exceptions, a long continued up and down fluctuation of temperature has no special effect other than you would expect from the temperatures themselves. No, the effects of abuse simply add to one another, their sequence or spacing makes no difference.

Damage Can't Be Undone

Of this we are sure: Once damage is done it can't be undone by kind treatment. If a shipment of frozen food comes to you at a temperature of 25 or 30 F, you surely do want to get that temperature back down to zero as soon as possible—but just to avoid doing further damage, not to heal the wounds already received.

One of the questions we have studied very carefully is this: How much change in quality occurs under the conditions of time and temperature that actually exist in our commercial distribution system? We had a good idea of the range of these conditions from the results of the 1952-53 survey and other information furnished by the industry. We combined conditions in many different ways, in order to cover the range. The results are clear cut. Combinations of temperature and time will sometimes be encountered in ordinary distribution practice to produce significant changes in the quality of the food —changes great enough to cause consumer complaint.

Now this is a very disturbing fact. It means that when Mrs. Housewife shops for frozen foods she picks up some whose "high quality" life is already gone. The freezer space in the average home is not too good, so this low-quality food is going to slip still further downhill before it is finally consumed.

Chemical Tests Show Quality

The results of our research offer a new approach that can be used by people in the industry. By making certain chemical tests that we have worked out you can get a measure of the amount of abuse a product has already suffered and how much high-quality life remain in it. We have such tests already that can be applied to several fruits and vegetables; but nothing similar as yet for poultry products.

I shall illustrate the way these tests would work by describing one that can be applied to strawberries. This test involves measuring the amount of ascorbic acid (vitamin C) and its oxidation products in a sample of berries—not a very difficult or elaborate chemical analysis. Freshly picked strawberries are a very good natural source of ascorbic acid. If handled properly in the harvest field and the processing plant, the freshly frozen product still contains about 98 percent of the original ascorbic acid, and the color and flavor of the fruit are excellent. If, now, we put the packed berries in storage, withdraw samples from time to time, make this chemical test and also submit the sample to a taste panel to judge appearance and flavor, we find that the amount of ascorbic acid begins to fall immediately. The higher the temperature of storage, the more rapidly this happens. For a while, the trained taste panel will not detect any change in color or flavor. When six percent more, that is, about eight percent altogether of ascorbic acid has been lost our taste panel begins to pick up off-flavor and discoloration. If the frozen fruit has been held at a temperature of 20 F, it reached that point in 6-13 days.

Now if we keep on sampling for a longer time, eventually our berries will be so badly off in color and flavor that consumer complaints would be received. According to the judgment of quality-control men who have cooperated with us in this work, this point is reached in four to six weeks at 20 F. The ascorbic acid loss by that time is 25 percent. Evidently we have in this chemical test an important yardstick of quality loss and quality remaining.

But here is a novel and especially useful part of the ascorbic acid test as we apply it. What we want, of course, is a test we can use on a sample taken anywhere in the distribution chain. Strawberries vary in the

amount of ascorbic acid they contain to begin with. How do we determine the "percent loss" of ascorbic acid if we do not have a sample of the original berries for comparison? We find that in these fruit products we can analyze for ascorbic acid and its first two oxidation products, and the sum of these three remains constant—so we do not have to have the original berries to determine how much they contained.

Applying Results of Test

Now how can we apply our yardstick? Well, if we test a sample and find the ascorbic acid loss from it has been eight percent, we know it has been through time and temperature experiences equivalent to from one to two weeks at 20 F; it is still excellent in quality, but is now at a point where very critical judges would begin to find fault. The end of the "high quality" life of that product would come soon—perhaps at a point corresponding to 10 percent loss of ascorbic acid, or perhaps 15 percent loss—certainly less than 25 percent loss. Choice of the end-point would be a merchandising judgment, weighing all the factors we have mentioned.

I have gone into considerable detail about this ascorbic acid test in strawberries, in order to emphasize the significance of this kind of approach to the improvement of operations in the industry. The kind of test will vary from one product to another. For example, with raspberries although we can determine the ascorbic acid loss, it is more convenient to measure the extent to which the red color of the berries is equalized out into the surrounding sirup; in peas and beans it is the ratio of chlorophyll to pheophytin. In addition, a test of the distribution of soluble solids between frozen fruits and the packing sirup is a sensitive indicator as to whether defrosting, lasting at least a day or two, has occurred.

Putting these things all together, there is now at your disposal powerful means for insuring control of quality of frozen foods. Anyone of you along the line can check up and find out how good a job was done by everyone who handled the product before you. It would be quite possible to work out industry standards for quality at each intermediate point in the distribution. The system would work fine right down to the last two links in the chain—the retail store and the family refrigerator. Chemical tests are out of the question there, and unfortunately those are the two links that most need strengthening. There you will have to depend on a vigorous educational campaign.

Areas of Greatest Need

I shall end by presenting my own idea of four areas in which industry interest and activity is needed.

In the first place, the industry should endorse and support a greatly expanded program of research on frozen foods. After all, the industry was founded on research, and research has found a way out of other difficulties. During our work of the past few years we have discovered ways to make certain frozen products more resistant to change and therefore more sure to reach the consumer in excellent condition. A great deal more research is needed on the raw material production and handling, and processing, freezing, and packaging improvements that will increase the stability of the packed foods.

Continued development and improvement of equipment is another need of the industry. Mechanically refrigerated trucks and railway cars are doing an excellent job, but more of them are needed. Small-scale storage space, including the retail display cabinet, may be a most vulnerable spot, especially if it has little or no reserve refrigerating power. Warmed product entering such a space will stay warm for a long time, not come back quickly to zero as it should. When we remember the equipment available only a few short years ago we are amazed that so much could have been done so rapidly, but we should also realize that the industry is not yet adequately equipped in all respects.

More checking up on times and temperatures needs to be done. This is a basic element in improved control of conditions. Every few years a broad sampling of conditions throughout the industry should be carried out, similar to the thoroughly planned and carefully executed 1952-53 survey. Comparison with past measurements will quickly tell which particular operations are lagging behind in the effort toward 100 percent realization of the industry objective—zero or better at every step.

If I were handling frozen foods myself in any quantity I should certainly want to keep my own record of their temperature as I received them, how long they remained in my hands, and their temperature as I passed them along to the next man. But I would remember that the entire history of the product is going to be reflected in its quality at the time it is finally used, so I should also sacrifice a certain number of packages for the sake of getting reliable information about the quality remaining in my product and the extent of time-temperature damage it had already suffered.

Finally, there is this tremendous job of education to be done. You need to reach everyone in your own organization, from top to bottom. You have to reach those in related industries who may have occasion to handle frozen foods. Your message is simple in broad outline—"Handle frozen foods like the perishable commodities they are! Handle them quickly! Rotate the stock faithfully! Do not let them warm up, even for a little while!" The technical detail, how to accomplish these things in a given operation, can best be taught by men intimately familiar with the operation. It may require posters, cartoons, slogans, incentives for careful handling, penalties for carelessness.

We feel that one of the most important values of our research on time-temperature tolerance is the imposing, impressive body of facts showing how carefully frozen foods need to be treated. People have been preaching zero degrees for a long time; here is conclusive evidence that they were not kidding. If the industry believes the time is now ripe for an educational campaign, our Branch of the Agricultural Research Service will be happy to make the facts known in whatever way will do the most good.

Frozen Sardines

THREE Canadian and four Yugoslavian research workers have collaborated in a prolonged and comprehensive study of the benefits of freezing sardines for holding prior to canning. The sardines were caught in the North Adriatic Sea (Yugoslav Sardines), processed at the Rijeka Hygiene Institute, Yugoslavia, and the canned samples were tested at the Food Inspection Lab at Halifax, Canada.

The objectives were to determine maximum holding periods at various temperatures, and it was concluded that freshly caught fish should be iced within a very few hours and that holding in ice should not exceed three days. They found that glazed and unglazed air-frozen sardines can be held at minus 4 F up to a month and make good canned product, but they recommend that minus 20 F be used in commercial practice.

Chicago Section, ASRE Celebrates Fortieth Anniversary

FORTY years of Section activity in the American Society of Refrigerating Engineers was celebrated at Chicago on April 11, 1957 with a special presentation to two surviving members of the original chartered group who are still active in the Society. The two so honored were O. P. Heller, Creamery Package and Manufacturing Company, and E. J. Ward, United Cork Companies. There were originally 16 charter members, among whom were the late J. F. Nickerson, founder of Nickerson & Collins Company, publishers of INDUSTRIAL REFRIGERATION and REFRIGERATION SERVICE and CONTRACTING magazines. The late G. T. Voorhees, well known as a frequent contributor to ICE and REFRIGERATION was also a charter member of the Chicago Section.

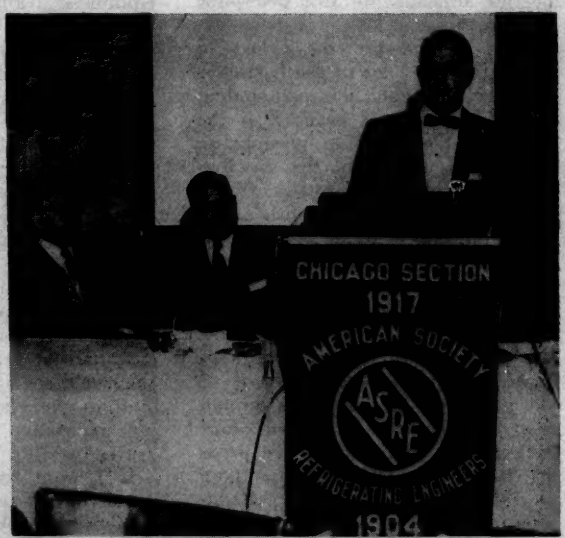
Ed. Lowe, USDA, Chicago Section Speaker, ASRE, April.

Past Chicago Section Chairmen, ASRE, pose for this photograph at the 40th anniversary meeting. Seated left to right around the table are: Ben E. Seamon, chairman in 1943; Wm. S. Bodinus, 1945; C. L. Eichstaedt, 1951; Leon C. Buebler, Jr., 1949, (past national president, ASRE, 1955-56); J. J. Smerz, chairman in 1953; E. J. Robertson, 1955, and H. J. Prebensen, 1948. Standing left to right are: J. P. McShane, 1947, (national director, region 10, ASRE); Deane E. Perham, 1935 through 1939; K. E. Wolcott, 1952; Clarence M. Sieben, 1946, and J. E. Salmon, 1954. Absent on ASRE business was Fred P. Neff, 1950. Dean Burgess H. Jennings, 1944, A. B. Stickney, 1941, Jas. E. Petermann, 1940, Oscar A. Anderson, 1931 through 33, and Harry R. Halterman, 1929 through 1930, were unable to attend.

Heller and Ward were honored by their section through the presentation of framed facsimiles of the original charter of the Chicago Section. The presentations were made by Deane Perham, the section historian and past section chairman. Herbert Tinning, assistant secretary of ASRE was present, representing ASRE National President Carlyle Ashley. Tinning presented the message to Heller and Ward from Ashley, designating both gentlemen as honorary co-chairman of the ASRE Fall meeting which is to be held in Chicago November 14 to 16 at the Shoreland Hotel.

Heller and Ward both addressed short remarks to members and guests in attendance. E. C. "Bill" Ward, son

Facsimiles of the original charter issued 40 years ago to Chicago Section, ASRE which were presented to two charter members still active in the society. Holding the framed documents are, left, O. P. Heller, and at right, Edwin J. Ward. Section Historian, Deane Perham, center, made the presentations.



40th Anniversary business meeting of Chicago Section, ASRE, is convened by E. C. "Bill" Ward, section chairman, son of one of the original 16 founders of the section. At Ward's right, reading left to right in the photograph are O. P. Heller and Edwin J. Ward, the two surviving charter members.

of charter member E. J. Ward, is the Chicago Section chairman and presided. One of the comments passed by another speaker was to the effect that it was quite appropriate for the Section to honor these gentlemen in such a way while they were still active in their own businesses and in society affairs. That speaker reflected on a statement he had heard some years previous by an engineer honored similarly. The engineer is quoted as commenting that he had lived all his life to obtain a certificate of some sort and now that he was honored he had no engine room in which to hang his parchment. Ward and Heller are both active in their organizations.

Time Temperature Tolerance Featured Speaker Topic

Featured speaker at the Chicago Section meeting following the 40-year ceremonial, was Ed. Lowe, supervisor, Engineering and Development Section, Western Regional Laboratory, USDA, Albany, California. "The Time-Temperature Tolerance of Frozen Foods—Test Facilities and Research Results" was the topic of Mr. Lowe's discussion. Improper storage temperatures to which frozen foods are often subjected between manufacture and final consumption have an adverse effect on product quality. Unique test facilities were designed and installed at the Western Regional Laboratory, Albany, California, for study of the time-temperature tolerance of various frozen foods. These facilities were described, and the results of the experimental work were presented for a number of fruit, vegetable, poultry, and pre-cooked products.

As is customary with the Chicago Section, the Committee For Service to Engineers presented the pre-dinner program. Wilbert Schroeder, representative of the Socony Mobil Oil Co., led a round table discussion on lubrication problems in refrigerating plants. Oil seperation was discussed in particular. The Chicago Section concluded its 40th Anniversary Celebration with a dinner dance at the Shoreland Hotel on April 27. The dinner dance was chairmanned by Ed. Campbell of the Wolverine Tube Division, Calumet & Hecla, Inc.

Lockers in New Warehouse

Locker space for eight carloads of frozen foods will be included in the new 54,000 square foot supply depot for The Associated Grocers Wholesale Company at Toledo, Ohio to be completed in early summer. The warehouse will have a 13-car siding to the Nickel Plate and Wabash.

Air Conditioning Controls For Motor Vehicles at Chicago ASRE Meeting

REMINDING its membership of the motoring comfort to be achieved during the coming summer months, Chicago Section, ASRE, presented a speaker on "Controls for Automotive Air Conditioning" at the March 14 meeting in the Builders Club, Chicago. John T. Moren, Engineer Manager, Car Heating and Air Conditioning Technical Laboratories, Chrysler Corp., Detroit, was the speaker on this topic, so timely to the transportation industry. At the same meeting the Committee for Service to Engineers presented Bert C. McKenna, a member of the Section and National President of NAPRE, in a discussion of a unique method for aligning cylinders on horizontal compressors.

Automotive Air Conditioning

Guest speaker Moren opened his discussion by reminding members and guests that the automotive air conditioning field has had a rather short commercial history, the automotive producers themselves having gotten into the game only in 1953. In discussing methods of control, Mr. Moren discussed first fan speed regulation. Then he picked up the topic of refrigerant by-passes, discussing three arrangements for by-passing the evaporator as a means of control. He also discussed clutch control and then concentrated his effort at description of the reheat method of control.

According to Moren the introduction of automotive air conditioning was such a dramatic contribution to the motorist's comfort that the simple presence of cool air was enough to please the early customers. Air distribution and temperature control were rather elementary and left considerable to be desired. The growth and acceptance, however, of a new article brings with it increased discrimination on the part of customers and prospective customers so that the unit that satisfied the owner in 1953 will not satisfy him in 1957. This increased demand for refinement in the car air conditioner has brought notable improvements in several phases of operation — such as simplified controls, better air distribution, more exact temperature control, and lower noise levels, among others.

In summing up his discussion Moren stated the advantages anticipated for the reheat control system have been realized to a large extent. The system is free of any change in noise level or change in odor when a new temperature level is provided. The process of cooling and dehumidifying incoming air to the maximum extent and then reheating it, produces an atmosphere within the car that is pleasant at all times.

While many new improvements will be anticipated for future models, he stated that it can be generally agreed that the performance of present-day automotive air conditioners, both in overall capacity as well as in air distribution and temperature control, provide the prospective owner with a very desirable product. The automotive air conditioning industry is in that stage of its growth when great strides are being made in improving and refining the system and it seems only reasonable that great strides will continue to be made in providing more comfort and satisfaction to the consumer.

McKenna's presentation was a condensation of an article which appeared in the March 1957 issue of INDUSTRIAL REFRIGERATION entitled "Horizontal Compressor Alignment is Important". McKenna described the method of aligning the cylinders through use of photographs which were passed around at the conference, and by chalk talks. Orders placed in recent months by many major meat packers for this type of equipment, had prompted the Committee for Service to Engineers to schedule McKenna's discussion.

Heat Pump to be Used In Office Building

A 550-ton York Corporation compound compression air source heat pump system, the largest of its kind, will provide heating and cooling in the new 10-story home office building of the Columbus and Southern Ohio Electric Company in Columbus, O.

The system, according to Ray K. Serfass, vice-president and general manager of the industrial division of York Corporation, subsidiary of Borg-Warner, will cool the 180,000 square foot building during the summer and will use outside air as a heat source to warm the building's interior in winter. No supplementary electrical heating or convention fuel-fired boilers will be used.

In addition to the system, which will be located in a roof-top penthouse engine room, six small air source heat pump systems will be used for special areas.

Warehousemen and Frozen Food Packers Discuss Mutual Problems

THE Warehousing Committee of the National Association of Frozen Food Packers met with the Warehouse Operations Committee of the National Association of Refrigerated Warehouses January 7, at Miami Beach, Florida, during the Frozen Food Convention. Sixteen packers and warehousemen also attended as guests.

Dick Gelin, Chairman of NAFFP Warehouse Committee opened the meeting with a few remarks regarding the continuing cooperation needed between packers and warehousemen to facilitate further efforts to solve various problems. Specific problems discussed were:

Industry Problems

What is the responsibility of warehousemen regarding selection of refrigerated equipment for transportation of frozen foods?

Approved and recommended lists of rail cars have been furnished most of the warehouses, however there is no such list of refrigerated trucks; therefore the Committee felt the warehousemen should exercise good judgment in seeing that the motor carrier is furnished the right kind of equipment for hauling frozen foods. The Committee urged that the warehousemen turn down equipment that did not have: (a) Floor and wall racks of sufficient size to insure positive circulation around entire load. (b) Sufficient insulation in walls, ceiling, and floor to insure zero temperature. (c) Refrigerating equipment capable of holding load at zero. (d) Temperature of truck is below 20 degrees before loading. (e) See that merchandise is loaded properly.

What is the warehouseman's position when storers' merchandise is picked up by buyer in non-refrigerated truck? From the general statements made by warehousemen present, this is an every day occurrence. It is a recognized problem and one which the frozen food industry is trying to overcome through educating the buyer. One packer did ask that he be notified when his merchandise was picked up by buyer's non-refrigerated truck, but those warehousemen taking part in this discussion were reluctant to "get in the middle" on the subject. It was the general opinion the warehousemen's responsibility ended when the buyer signed the bill of lading.

Coding frozen food cases: Coding of cases with box car numerals, such as Birds Eye has set up, is a step forward. Similarity of cases containing various type of product makes it much easier for the warehousemen to find product where large code numbers are stamped on the cases.

Glued bundles: These are a source of constant trouble with warehouses, according to a letter from W. J. Mills, member of the NARW Warehouse Operations Committee, and some customers find them a great problem. Bundled products show up both short and over, and of late they have been separating the good bundles from those which are not in a suitable condition on arrival, and making separate lots of the bundles which are intact, and separating the bundles which are not in their entirety or where one or two cases are loose. This problem will be solved by the distributors themselves when they will refuse to accept glued bundles.

All the warehousemen present were more or less in agreement that glued bundles did present some problems, whether the increased tonnage handled per man hour inbound more than offset the eventual problems on outbound was questionable. Some of the packers stated they did not glue cases and did not intend doing so. It seems the glued bundle idea originated because of the penalty for small packages assessed by some warehouses.

Withdrawal charges: The NAFFP Committee still feels about the same way it did last year, that the withdrawal charge is an emergency wartime grant in lieu of increased storage rates not granted, and should now be modified or eliminated. It was generally agreed that due to increased labor costs the warehouseman was due to recoup these increases somewhere in his charges, but that the charge should be applied only to those items responsible for his increased costs.

Standard forms: One packer urged the warehousemen to adopt forms on which there would be a designated place for lot number, date, number of packages, weight, shipper's name, etc. The forms now received have all this information but no two have it in the same place on the form, so that each form must be carefully examined in order to get this standard information. He also urged that forms be typed if at all possible, with full description of product being shown.

Temperatures: Joe Melvin, Minute Maid, reported the results of their survey last year which showed some warehouses still showing high temperatures and merchandise stacked directly on floor and against walls, with no sign of dunnage being used. They found instances where the warehouseman's thermometers were not recording accurately. When they were checked with an accurate thermometer, variances of some 5 to 10 degrees were discovered. Using zero as the accepted temperature, they found 31 percent of the warehouses in one area had temperatures above zero.

Some of the warehousemen present questioned the location of thermometers in the room, time of day checked, proximity to door, etc. The result of this discussion was that the NAFFP Committee urged that all warehousemen check their temperatures accurately and regularly, that thermometers be checked periodically for accuracy, that sufficient refrigerating power be available for maintaining zero under adverse conditions as well as under perfect condition.

Uruguay Ships Chilled Beef

URUGUAY plans to ship 5,500 tons of chilled beef to the United Kingdom in the near future. This will be their first commercially significant shipment of chilled beef to the United Kingdom since the war. Cattle slaughter in Uruguay, which almost came to a complete stop during the long strike this summer, has been resumed and is now at about 36,000 head a month. This is still considerably below full production of about 100,000 a month.

The Government-sponsored Frigorifico Nacional has been unable to receive cattle for other than local consumption because it is behind in payments to producers. Private packers are concentrating upon the production of frozen beef to Continental Europe and less for canning, because they expect the Government to give them a better exchange rate on frozen beef.

Storage-Freezing Plant

A COLD storage and freezing plant will be built at Fredericton, Canada to serve a new fish filleting plant on the south shore of New Brunswick by Connors Brothers, Ltd. The plant will also provide service to other fish producers and farm products.

Protecting Perishable Foods During Transportation by Truck

THE transportation of perishable food products in refrigerated trucks and trailers has increased rapidly in recent years. This transportation is provided by thousands of truck operators, ranging from small owner-operators with only one or two vehicles to large truck lines operating hundreds of units, the motor truck movement of hundreds of food products, many of which are fragile and easily susceptible to spoilage, freezing, overheating, contamination, and other types of damage, in many different types of equipment in all kinds of weather has posed some serious problems for shippers, truckers, and receivers of the products.

Motor truck equipment is available to provide the optimum temperature and humidity for perishable commodities during transportation. However, the requirements of different commodities vary widely, and it is necessary that the shipper or trucker know the specific needs of the commodity being transported so that he may use the right equipment in the right way.

Many improvements in the dietary standards of our population are traceable to advances made during the 20th century in transportation and refrigeration of a wide variety of perishable foods. In addition, significant changes have occurred in methods of food processing. The development of new forms of processed foods, such as frozen concentrates and other types of frozen foods, has resulted in the production and distribution of highly perishable products having rigid requirements for protection during transportation. If we are to take full advantage of these recent technological advances in food processing, the commodities must have full protection all the way from the producer to the consumer.

Taken from Agricultural Handbook No. 105 U. S. Dept. of Agriculture By Harold D. Johnson and P. L. Breakiron, Marketing Research Division, Agricultural Marketing Service.

The Use of Ice

Ice is a good refrigerating medium, but it presents drawbacks when used in over-the-road, long-distance hauling. It is heavy, requires considerable labor to handle, and accelerates deterioration of the truck body by its everpresent moisture. Refrigeration produced by ice also diminishes as the ice melts, and to obtain maximum efficiency the bunkers should be replenished frequently. Salt may be used to obtain lower temperatures than would be provided by the ice alone, but the resulting drip of brine from the bunkers tends to corrode metal parts of the trailer body and produces an undesirable discharge on the garage floor or street.

Dry ice, due to its very low temperature (−109 F.), above which it starts to change from a solid to a gas (CO_2), can be used both for low temperatures such as those required for frozen foods and if properly controlled, for temperatures above the freezing point (32 F.).

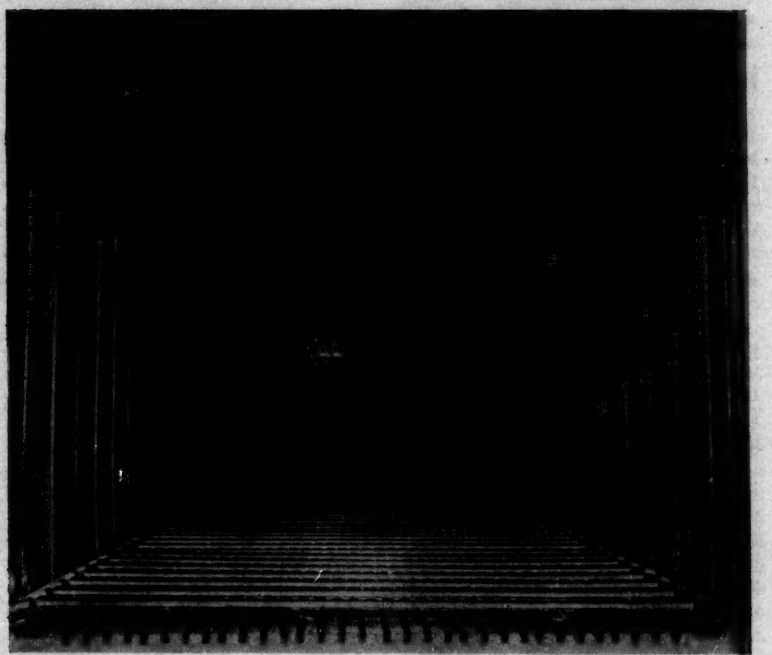
Of course, the gas so released is very cold, and has high heat-absorption qualities; it will freeze fresh foods with which it comes in direct contact. Also, it is heavier than air, and tends to settle to the floor of the trailer. Some truck operators have used dry ice in the transportation of frozen foods by spreading cakes of the ice over the top of the load. This method is unsatisfactory because the packages immediately surrounding the dry ice blocks and the pockets or spaces in which the gas settles are very cold, while other parts of the cargo are relatively unprotected. Consequently, little control of load temperatures can be maintained by this method.

Dry Ice in Emergency

Only in case of emergency due to failure of the refrigerating unit to operate should the dry-ice method be used. The only satisfactory dry ice refrigeration systems so far developed use a forced flow of air over a metal bunker surface, or a liquid secondary refrigerant circulated through a series of coils. Both systems are thermostatically controlled.

When transporting fresh fruits or vegetables, it is important to vent the CO_2 gas from the dry ice to the outside of the truck or trailer, as it may have an adverse effect on the product.

There are several types of mechanical refrigerating units, thermostatically controlled and made especially for motortruck transportation. Some types have the engine, condenser, and other accessories high on the outside of the nose of the trailer, with the evaporator coils and air-circulating fans located on the inside. Other types have the power unit and accessories under the frame of the trailer, with the cooling coils and air-circulating fans high inside the front end of the trailer. These units usually have from 2-ton to 5-ton refrigerating capacity. The size of the refrigerating plant depends upon the construction



Interior of a truck trailer equipped with adequate floor racks, side wall strips, and air duct on ceiling of trailer. All three of these desirable features promote adequate air circulation through and around the load.

of the trailer, the amount and quality of insulation, and the products to be transported.

Air Circulation

Regardless of the method of refrigeration used, whether it be water ice, water ice and salt, dry ice, or mechanical refrigeration, provision should be made for the cold air from the ice bunker or mechanical unit to circulate around and under the load. To obtain this free circulation of air, the inside of the trailer should have vertical wall strips not less than ¾ inch thick spaced at 8-inch intervals on each wall, and floor racks providing at least 2 inches of clearance under the load. Provision should be made by bulkhead or other means for adequate circulation of air at the front of the load. The rear doors should have vertical strips (2- x 2-inches on 8-inch center) to prevent blocking of air if packages fall against the door. Packages should not be loaded within 18 inches of the ceiling. Do not load directly in front of the air blast from the bunker or mechanical unit.

In protecting fresh fruits and vegetables in transit, cold air alone will not do the job. Moisture also is required to keep the products fresh and crisp. Relative humidity, as used here is simply a percentage figure indicating the amount of water vapor present in the air as related to the saturation point of the air at a given temperature.

Water Ice and Humidity

When water ice is used in the bunkers, and fans circulate the air, controlling the humidity does not present a problem. When mechanical refrigeration is used, however, moisture should be added by some means, such as sprinkling the floor. Many operators who use mechanical systems insure the humidity content and, in turn, the crispness of the produce hauled, by blowing "top ice" in crushed form up on top of the load. Because of the low temperature in the van, just above freezing, this ice melts very slowly and yet in melting provides the moisture needed. In produce hauling, this method is used quite widely in connection with dry ice or mechanical systems.

The vehicle used to transport fresh food products must be as nearly airtight as possible and must be constructed to retard the flow of heat as much as possible. An example of the principle involved here is found in the familiar thermos bottle, which is really two containers, one inside the other, with the air removed from the space between. The resulting vacuum gives the bottle its ability to maintain the substance in the inner container at a nearly constant temperature, for a vacuum offers great resistance to the transfer of heat.

Retard Flow of Air

Since it is impractical to build a trailer like a vacuum bottle, the next best alternative is to fill the space between the inner and outer walls with a substance that will retard the flow of air, since air in motion carries the heat from the outer wall to the inner wall. The insulating material used should be light in weight, fireproof, s a g p r o o f, verminproof, waterproof, nonacid, noncorrosive, and, of course, it should be a material which has a high insulating value. Insulating quality is subject to measurement, and the unit of measure is called the K-factor.

Some of the insulating materials now in use are glass fiber, kapok, cellular rubber, and cork board. The thickness of the material largely depends upon the temperature desired, the kind and efficiency of the refrigeration used, and the hauling distances involved. Thickness of insulation, depending upon these factors and the i n s u l a t i n g material employed, may range anywhere from one inch to six inches, or even seven inches in the roof. Except for frozen foods, a 3-inch thickness of insulating material is an average minimum requirement in walls, floor, and ceiling when hauls of several hundred miles are involved.

Precooling Products

Many shipments of fresh fruits and vegetables are loaded into trailers and accepted by the carriers when the product is not at the desired carrying temperature. This means that a d d i t i o n a l refrigeration is needed to reduce the product temperature quickly to the desired level for safe transport.

This precooling may be accomplished by using commercial portable mechanical units, by hydrocooling, or by the vehicle's own method of refrigeration, provided it has ample capacity.

When crushed or top ice is used inside the containers or over the top of the load, be careful that the crushed ice is not so cold that it will freeze the part of the product with which it may come in contact. Ice may come out of a storage room with a temperature as low as 25 degrees.

It takes a great deal of training and experience to protect and transport perishable products properly. Each driver is responsible for the truck and the cargo while it is in transit, and he should know the refrigeration requirements of the commodities he hauls. The driver should be thoroughly familiar with the operation of his refrigeration unit in his trailer, and he should be provided with a list of servicing points along his route in the event of mechanical failure.

All mechanical repairs should be made by persons authorized or qualified to do so. Any adjustments by the driver ordinarily should be limited to those of a routine nature, unless he is thoroughly familiar with the operation and maintenance of the unit and has been properly trained to repair and service it. Tampering with mechanical refrigeration units by unqualified personnel may frequently result in serious damage to the units or get them further out of adjustment.

Shipping Products Requiring Low Temperature

For shipments of frozen foods and other commodities that require exceptionally low temperatures during transit, the interior of the vehicle should be precooled before loading. If the truck or trailer is equipped with a mechanical refrigeration unit, the unit should be placed in operation, with the doors closed, and the temperature of the interior of the vehicle should be reduced as nearly as possible to the recommended transit temperature of the product being shipped. If water ice or dry ice is used for refrigeration, the air circulating fans should be placed in operation after the ice bunker has been filled and the doors closed.

When commodities like potatoes or onions are shipped during subfreezing weather, the interior of the vehicle should be preheated before loading. If the vehicle is equipped with a built-in heater, it should be placed in operation sufficiently in advance of loading to raise the air temperature of the interior to or near the recommended temperature of the product to be loaded. In vehicles not equipped with heaters, preheating may be accomplished with various types of portable heaters. During subfreezing weather, if the truck or trailer is being loaded in an unenclosed area, it is desirable to keep the heaters in operation to help maintain the desired temperatures during loading.

The publication continues with recommended protective services for a long list of fruits and vegetables, giving the desired temperature and relative humidity, average freezing point, and recommended method of refrigeration.

The Distribution and Marketing Of Frozen Fishery Products

THE freshness and quality of frozen fish is determined to no small extent by the temperatures and humidities they encounter while in cold storage. Storing frozen fish at 0 F. or lower and at relatively high humidities makes possible the maintenance of a high quality product over a considerable longer time than is possible if high temperatures of storage and low humidities are used.

The geographical location of the comparatively few coastal fishing ports and the large demand for frozen fish in inland cities early resulted in the need for refrigerated methods of transportation. Many obstacles have been overcome since the first refrigerated shipment by rail, in July 1851, when several tons of butter were shipped from New York to Boston in a railroad refrigerator car insulated with sawdust and packed with ice. Since then, modern techniques and research have produced the low-temperature refrigerated carriers of today.

There are over 125,000 ice-bunker cars and over 1,000 mechanical cars now in use in this country. Mechanical cars are still rolling off the production lines, but whether they eventually will replace the bunker car for all types of services is not determinable at present. There is a little doubt, however, that the mechanical car will replace, within a very few years, the bunker cars used in frozen-food transportation because bunker cars cannot obtain the low temperatures necessary to insure adequate quality of the frozen product. A cost study now in progress by some of the car manufacturers and railroads will soon establish the economic feasibility of the mechanical refrigeration car for the transportation of non-frozen products.

In the fishing industry, a processor finds it difficult to predict the amount of fish that can be shipped on a definite date because the supply of fish is dependent upon many indeterminate factors, such as the abundance of fish and the weather. Thus, railroad cars often were used at less than full-load capacity, resulting in higher costs of transportation per pound of fish.

Refrigerated Trucks

This need for flexibility in the transportation of frozen fish coupled with the improvements in refrigerated trucks and the fact that large companies could lease or operate their own trucks led to the increased use of refrigerated trucks for transportation of frozen fishery products. Today, considerable quantities of fish are transported by refrigerated trucks from vessel to processor, then from processor to cold storage, and finally from cold storage to the various markets within the country. The refrigerated truck has indeed played no small part in the wide, flexible transportation system that now is used to distribute frozen fish.

Millions of pounds of fish and other frozen foods are transported yearly by cargo ships that have either partly or totally refrigerated space throughout. The application of refrigeration to cargo ships has lagged only slightly behind the development of cold-storage plants ashore.

The quantities of fishery products that are shipped by air are very small in comparison with the large amounts that are shipped in refrigerated railroad cars or in refrigerated trucks. The transportation by air of some of the more highly perishable fishery products—such as live lobsters, oysters, and fresh fish fillets—is, however, of commercial significance and is increasing from day to day. In the transportation of these fishery products by air, the comparatively short period of time in transit makes it possible to obtain fish of high quality, within hours after they have been landed by the fishing vessel. With such products, the increased cost of transportation is justified because if the other more common methods of transportation were used, it would be difficult and almost impossible to obtain the high quality desired, owing to the long period of time during shipment.

Prior to the introduction of refrigerated railroad cars and trucks capable of maintaining temperatures of 0 F., frozen fishery products often were packed into insulated containers with suitable amounts of dry ice and were shipped via truck or railroad express to the markets throughout the country. The quantities of fishery products transported by this method were relatively small because of (1) the high shipping costs per pound of fish, (2) the extra handling involved, and (3) the limited time that the low temperatures could be maintained during transit.

Marketing of Frozen Fish

Packaged frozen fish fillets were first marketed in the late 1920's to supply a demand for fillets in markets beyond the reach of the New England fresh-fillet industry. The demand for fillets was the impetus that marked the beginning of packaged frozen foods.

Prior to this time, frozen fish were simply sharp frozen and glazed to protect them from desiccation and from the development of rancidity. Fillets and steaks, which then were new market items, could not be handled like dressed fish because they were difficult to glaze and package. As a result, new packages, wrapping materials, and methods of freezing were developed.

During the early years, the sale of frozen fish was severely handicapped by the lack of marketing facilities. The greatest problems in developing these facilities were (1) the then current practice of retailing frozen fish in meat markets and (2) the lack of sufficient volume to warrant the development of separate marketing facilities for packaged frozen foods.

Some of the pioneers in the frozen-fish-fillet industry applied their experience with fish to the packing of other frozen-food products. As the quantity of frozen foods increased, these pioneers recognized a need for good marketing facilities if their products were to reach a nation-wide market, and some of them developed their own marketing organizations.

This is taken from part five in a series of five on Refrigeration of Fish. A previous release, "Factors to be Considered in the Freezing and Cold Storage of Fishery Products" was published in the September 1956 *Industrial Refrigeration*. This series was prepared under the general supervision of Charles Butler, Chief, Technological Section, Branch of Commercial Fisheries, Washington, D.C., and edited by Joseph W. Slavin, Refrigeration Engineer, Fishery Technological Laboratory, East Boston, Mass., and F. Bruce Sanford, Chemist, Fishery Technological Laboratory, Seattle, Wash. The information was compiled and published by The Fish and Wildlife Service. After a period of use by the fish processing industry, these will be combined into a manual to supplement existing publications on the subject.

These and other nation-wide marketing facilities for frozen fish and for frozen foods in general have enabled the fishing industry to grow tremendously.

The cold-storage warehouse aids in the wholesale distribution of frozen foods, including packaged frozen fish, and serves as a place for storing these foods from one season to the next. Wholesalers receive their frozen foods either by railroad refrigerator car or by refrigerated truck from the warehouses of producers or distributors. Some wholesalers pick up their frozen foods with their own refrigerated trucks. Wholesalers who do not have their own warehouses usually rent refrigerated rooms in a public warehouse for use as a working area in which frozen-food orders can be assembled and dispatched.

Frozen fish are most commonly transported in trucks having a well-insulated van body. The amount and type of refrigeration provided in the van body varies. Frozen fish are transported satisfactorily in trucks equipped with mechanical refrigeration, dry-ice refrigeration, or stored refrigeration in "hold-over" plates.

The low temperature necessary for preserving frozen fish during long hauls can be obtained best by use of a truck employing mechanical or dry-ice refrigeration. With mechanical refrigeration units, which are usually operated by a separate internal combustion engine, little or no attention is required during transit; whereas with dry-ice units, care must be taken to replenish the dry ice during transit in order to maintain the required temperature. Trucks refrigerated by means of hold-over plates are best suited for transporting fish over comparatively short distances because hold-over plates provide only a limited refrigeration effect.

Refrigerated delivery trucks are not designed to lower the temperature of the product or to serve for prolonged storage but merely to absorb the heat introduced in transit. Best results are obtained if the trucks are precooled and loaded quickly in the morning instead of the night before the deliveries are to be made.

Retail Operation

Facilities for the storage of large reserves of frozen foods usually are not found in the retail store. Most retailers have only retail-display cabinets some of which are large enough for a small reserve of frozen foods. This arrangement requires that the retail cabinet be replenished almost daily by the wholesaler. Stores that have a large volume of business, however, need storage other than that which is available in the retail cabinet. Some retail stores have walk-in storage located in a part of their storage area. Other stores use the older chest-type storage cabinets for holding a reserve supply.

Frozen-storage facilities at the retail level are governed by the same factors that apply to order-assembly rooms, except that the temperature should be held at 0 F or lower. Inventories should be limited to one week's supply, and a complete turnover of the products in the storage should occur every week. The facilities should be defrosted regularly.

Merchandising Requires Displays

Modern merchandising requires displays that place the frozen foods in quantity before the eyes of the customer so that he will be given an impulse to buy. The only display cases that fulfill this requirement are of the large self-service open-type that have their entire contents accessible at all times. These modern cases are usually quite deep so as to provide a well for the retention of low-temperature air, yet they are wide enough so that their contents are easily accessible—even down to the last package. The average food store requires at least 25 linear feet of display case to provide room for frozen fish and the variety of other frozen foods that are available.

The quality of frozen fish is usually subject to greater deterioration during marketing than it is during the time that the fish are in storage in the frozen-food warehouse. Marketing exposes the product to the most severe conditions. It is even possible, through lack of necessary precautions, for isolated packages or cases of frozen fish to thaw while in transit from the wholesaler or while in the retail store.

Packaged frozen fish that are soft to hand pressure can be considered of doubtful quality because there is no way of knowing how long they have been in a soft condition. Similarly, packages that are misshapen, yet hard frozen, may be indicative of frozen fish that thawed completely and that was then refrozen. Again, the quality is doubtful because there is no way of knowing how long the fish may have been held in a soft, unfrozen condition. It should be noted, however, that slightly misshapen packages can result when freshly packaged fish are frozen without the benefit of pressure and that slightly misshapen packages therefore do not necessarily indicate poor quality.

Low Temperature More Effective

Frozen foods do not need to thaw to be subjected to accelerated rates of quality loss. Storage at temperatures of 10 or 15 F permits much more rapid loss of flavor and color and development of rancidity and toughening than does storage at 0 F. Therefore, to obtain a reasonable storage life, frozen fish must be held at 0 F or lower. Frozen fish that are stored at −10, −20, or −30 F may be expected to retain their quality for an even longer time.

Arizona Vineyards Builds Large Cold Storage Plant

A LARGE cold storage plant is being constructed at Glendale, Ariz., at an estimated cost of $100,000 by Arizona Vineyards, a subsidiary of Arrowhead Ranches. It will provide cooling capacity for 35 freight carloads of grapes.

The 9,660-square-foot storage tank is of concrete construction, with walls and floors insulated with styrofoam and redwood bark. The five-room plant will be cooled by blasts from several huge ice bunkers, each equipped with several motor-driven fans.

Arizona Vineyards anticipates its earliest and busiest season, which is expected to get under way by the last week of May. The firm is rushing construction of the cold storage plant to be ready for the bumper season during which it will handle grapes from over 730 acres.

Lee Hanks, sales manager, said the company will use a new method of grape processing this year. Previously harvested and packed in lugs, much of the grape harvest this year will go into attractive cellophane, two-pound packages.

Canadian Ice Machine

SKATING and curling rinks were the largest buyers of equipment from The Canadian Ice Machine Company, Toronto, in 1956, although the most important buyers were established customers in the dairy, ice cream, cold storage, meat packing, canning, fish freezing and brewery industries, according to H. V. Shipley, president. Sales of new equipment, accessories and supplies set a record. The company reported consolidated net profit of $121,605 for 1956, 35.5 percent higher than $89,768 for 1955.

How to Cut Refrigeration Costs and Increase Capacity with Better Purging

If you don't have an Armstrong Purger, chances are your head pressure is 10 to 40 lbs. above theoretical—because all the non-condensables are not being removed from your system. Have you checked your pressure lately?

Remember, for every 4 lbs. excess head pressure, power costs go up 2% and capacity goes down 1%. You can quickly figure how much inefficient purging is costing you.

Your head pressure will *always* be within a couple of pounds of theoretical with an Armstrong Purger. It rids your system of air with almost no loss of refrigerant.

Here is what this means to you:

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"Power costs cut 20%"—Rubenstein & Son Produce, Inc., Dallas, Texas.

Increased Capacity
"Compressor capacity increased 10%"—Gulf Oil Corporation Wax Plant, Philadelphia, Pa.

Less Refrigerant Used
"$500 annual ammonia saving"—Howard Johnson Ice Cream Mfg. Plant, Baltimore, Md.

Less Cooling Water Needed
"Cooling water consumption cut in half"—Producers' Dairy Company, Brockton, Mass.

Time and Labor Saved
"Can take care of other duties while purging is going on"—engineer at Alta Vista Creamery, Forth Worth, Texas.

Safety and dependability are assured by the design of the Armstrong Purger. Its forged steel construction can withstand over 2000 lbs. hydraulic pressure. Working parts are stainless and heat-treated chrome steel.

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You can try an Armstrong Purger for 30 days and if you are not completely satisfied you can return it for a full refund.

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Reinforced Plastics For Refrigerated Truck Manufacture

KENNETH C. SANDERS

The Heil Company
Milwaukee, Wisc.

The Frigid-Van one piece plastic refrigerated truck body molded by the Heil Frigid-Lite method.

REINFORCED plastic's invasion of the truck body field is proceeding steadily and gives every indication of having a most promising future. This is particularly true of refrigerated transportation.

The crucial point is whether reinforced plastic holds the answer to improved body construction. Basically our use of reinforced plastic materials, which we call Frigid-Lite construction, involves the molding of complete bodies and tanks in one piece in one molding operation using a matched metal die process. The resultant structure is a sandwich of inner and outer layers of glass fiber reinforced plastic completely and securely fused to an inner core of low density insulating material.

Advantages

Insulation — This reinforced plastic sandwich structure gives superior insulation protection with half the thickness because: (A) It has no "thermal bridges", that is, metal-to-metal contact from the inner to outer walls of the body that permits the entry of heat, and (B) the construction technique accomplishes a vapor seal that permanently locks out every moisture entry into the insulation, keeping it dry and effective for the life of the unit.

Weight Reduction — The use of reinforced plastic in a one piece molded sandwich produces a body that is several times stronger than equivalent metal units and yet is lighter in weight.

Rust and Corrosion — The use of reinforced plastic sandwich construction permits the elimination of metal components in the form of the internal frames and the external shell. Plastic is not susceptible to corrosion from the corrosive materials that would attack refrigerated bodies.

Structural Strength — One of the most outstanding aspects of the use of reinforced plastic sandwiches in one piece molding is the fact that this production technique permits the various component materials to perform dual functions, thus greatly increasing their utility. For example, the reinforced plastic skins of the sandwich structure, in addition to providing an exterior surface and protection for the insulation, also provide great structural strength and insulation since reinforced plastic has a very low thermal conductivity. Also, the rigid insulation core performs its primary function of keeping heat from the load, but, in addition, it actually becomes a load carrying member since it is tightly fused to the layers of reinforced plastic in the sandwich structure.

Repairs Are Easy

We have been very much encouraged with the ease with which plastic structures such as tanks and bodies can be repaired, restoring original appearance and strength by means of a relatively simple patching process whereby resin saturated Fiberglas is applied to the damaged area. Our service department feels that, generally speaking, repairs to plastic equipment can be made more simply, with less skilled workmen, faster and at less expense than is necessary when we have to repair one of our steel units.

Possible Obstacles

It would not be telling a complete story if we didn't recognize some obstacles that exist and that might tend to retard the growth of reinforced plastic as a truck construction material.

Price — The plastic resins and reinforcing materials used are considerably more costly than most of the conventional materials used in refrigerated body and tank construction. Quite obviously, this dictates that a premium must be charged for this type of equipment.

Tooling Costs — Another expense peculiar to plastic construction is the cost of dies from which equipment can be molded. In conventional construction where fabrication and assembly techniques are used, the cost of tooling is relatively insignificant in comparison, therefore, a competitive disadvantage could exist for plastic products.

Standardization — The one-piece molding of plastic truck bodies and tanks does not permit as much variation in design and dimensions as certain segments of the industry are accustomed to. The obvious reason for this, of course, is that the mold cannot be varied to any great extent and the cost is too great to permit having a great quantity of molds to make any of a number of sizes and styles. There is, however, a trend toward standardization.

Lack of Good Abrasion Resistance — As far as physical properties are concerned, plastic has everything that is desired with the possible exception of good abrasion resistance. But in those few instances where abrasion resistance is required, the plastic area may be covered with some protective material.

From paper presented at Twelfth Annual Conference of Reinforced Plastics Division of Society of the Plastics Industry.

Deionization of Water For Ice Manufacture

A 58-PAGE bulletin on deionization of water for ice manufacture has been published as Engineering Research Series No. 40, Bureau of Engineering Research The University of Texas; written by W. A. Cunningham, Professor of Chemical Engineering, and W. C. Mills, the University of Texas.

In the preface it is pointed out that when ice plants started changing from steam to electric power unexpected trouble was encountered in the appearance of the ice. Until that time most of the ice plants had frozen the condensate from steam engines or turbines; but, when electric drive was adopted, the ready supply of distilled water was no longer available and operators were forced to use water supplies from commercial sources. Whereas the steam condensate ice had been clear and free of gas bubbles, the ice made from the commercial water was very often cloudy and opaque. Customers objected to this change in appearance, since they were accustomed to the ice made of clear, distilled water.

New Freezing Procedure

Research conducted by Dana Burks, Jr., at the University of Illinois, showed that the opacity was caused by dissolved minerals and gases in the water being frozen. As a result of this excellent and complete study the industry generally adopted a new freezing procedure which is still in use. In the present day practice the water in the freezing cans is agitated with compressed air; as the water at the edges freezes, the minerals are frozen out and concentrated in the liquid water at the center of "core" of the bar of ice.

The dissolved gases are also frozen out, and swept from the ice surface at the ice-water interface by the air stream. As the freezing progresses the mineral concentration of the water in the core increases until it reaches a "critical" concentration above which clear ice can no longer be made from it. The core water is then pumped out, fresh water added, and the freezing continued. Unless the raw water has an unusually high mineral content the core water is removed only once, and the minerals in the remainder of the core leave a small white section in the center of the block of ice. When highly mineralized waters are frozen, a second core removal may be necessary.

The development of organic cation-exchange resins which are subject to acid regeneration and of anion-exchange resins subject to alkali regeneration has made possible the complete removal of dissolved ions at a cost sufficiently low to interest ice manufacturers in using them. This method has opened the way to the production of clear ice with no core removal and with moderate or no air agitation. In 1950 Embshoff was granted a patent for making clear ice with no air agitation by a process in which the water was deionized, the gases removed by vacuum and the water fed into the freezing cans through a special filter which kept re-solution of air to a minimum.

Deionization has been the subject of studies and reports by many other investigators and the process is currently in widespread use in many industries. Its reputation for simplicity of operation has caused it to be looked upon by many as being in the same category as "Uncle Jake's Snake Oil — Cures all Ailments of Man or Beast." True, its versatility has made possible the production of high-quality ice from many waters which could not otherwise be used; but the process is not without limitations and is definitely neither universal in application nor foolproof in operation.

The study on which this report is based was undertaken in order to gather specific data on the applications of deionization to the ice industry. Generally, these would be the applications involved in the operation of moderate-capacity plants by semi-skilled labor under conditions in which little or no immediate laboratory supervision would be available. Hence operational problems and economics have been of prime consideration.

The bulletin then discusses the subject in detail under: fundamental concepts; deionizing equipment and its operation; leakage and its significance; factors in regeneration; resin capacity, rinse water consumption; total solids adjustment; deionizing costs; monobed deionization; when things go wrong.

Conclusions

The conclusions are summarized as follows:

1. Quality ice can be made without core removal but with air agitation from deionized water containing at least 100 parts per million (ppm) total dissolved solids.

2. Efficient regeneration is the key to economical deioization. a. Optimum efficiency is obtained when using about 80 percent of the regenerant required for theoretical complete regeneration. b. Backwash regeneration generally gives unsatisfactory results. c. Substantial savings can be realized by re-use of the last half of the regenerant solution from the preceding cycle.

3. Excessive use of rinse water wastes both water and deionizing capacity. Rinse water consumption can be decreased by: a. Using proper regeneration. b. Allowing rinse water to remain in contact with resin bed for several hours. c. Recycling a portion of the rinse water.

4. Use of water of higher quality than is needed costs money; batch mixing is recommended for adjustment of total solids to maximum allowable level.

5. Total treating costs for efficient operation can be estimated by allowing four to six cents per thousand gallons for each grain per gallon of dissolved solids removed.

Booklet Promotes Virtues of Frozen Foods

THE National Association of Frozen Food Packers has released a new promotional booklet and announced plans for distributing it in large quantities to the public. Lawrence S. Martin, secretary-manager of NAFFP, said that the booklet is part of the association's over-all public relations program and will be directed primarily to students, women's clubs, and homemaking organizations.

The booklet is entitled "8 Ways To Eat Better" and stresses the eight advantages of using frozen foods in the kitchen. The eight advantages are convenience, year 'round availability, variety, consistent quality, nutrition, fresh flavor, natural color, and economy. There is also a brief history of the frozen foods industry.

Mr. Martin disclosed that the booklet will be used in conjunction with the association's 16mm motion picture "Design for Dining." This film is being heavily booked by schools and clubs in addition to its television showings, and plans are to offer the booklet free to audiences.

The booklet is 5½ x 8½ inches in size, 24 pages, and is printed with two colors inside and four colors on the cover. Mr. Martin also said that a price list will soon be distributed to member packers

Introducing TARS – A New Concept in Refrigerating Services

NATIONWIDE service on freezing, storage, distribution and other refrigerated product marketing problems is now available through a service network of independent cold storage firms. Formation of Trans-American Refrigerated Services Ltd., a nationwide network of five independent refrigerated warehousing companies, was announced in May by Lowell E. Kern, President of the new organization.

Trans-American Refrigerated Services Ltd. has been organized to provide the coordinated nation-wide refrigerated warehousing service that is essential today in the successful production and marketing of frozen foods and other perishable products, according to Kern. Member firms in the TARS group recognize that refrigerated warehousing must be an integral function in the complex pattern of modern distribution.

Packers, distributors, and large retail organizations need uniformly high standards of refrigerated service from initial freezing through the whole marketing process in order to guarantee the consumer a high quality product, Kern said in the announcement. They also require fast dependable communications and the flexibility and capacity necessary for efficient marketing of their products on a national scale.

To provide that vital link in the chain of distribution, the TARS group of five strong, independent refrigerated warehousing companies has been established to operate as a closely integrated network of 27 warehouses in 21 important production and marketing locations. The companies have 50,000,000 cubic feet of refrigerated storage space. The warehouses, at replacement cost, represent a value in excess of $62,500,000, including land and entire facilities ready to operate.

Member Companies

Member companies of TARS and member company executives on the TARS Board of Directors are:

Arthur N. Otis, President, Merchants Refrigerating Company, New York.

Herbert Farnsworth, President, Quincy Market Cold Storage & Warehouse Company, Boston.

Kenneth F. Stepleton, President, Continental Freezers of Illinois, Inc., Chicago.

Philip G. Kuehn, President, Wisconsin Cold Storage Co., Milwaukee.

Lowell E. Kern, Executive Vice-President and General Manager, Terminal Ice and Cold Storage Company, Portland, Oregon.

Sales, service, and research facilities of all TARS members have been coordinated with each member company representing all other member companies. Packers, distributors, supermarket and chain store organizations can obtain prompt service on freezing, storage, distribution and marketing problems in any and all TARS areas by working through the TARS company most convenient to their headquarters office.

In his announcement of Trans-American Refrigerated Services Ltd., Kern emphasized the modern function of refrigerated warehousing in distribution. The rapid growth in merchandising of frozen foods and other perishable products and the vast expansion anticipated in the next few years demand a scope and flexibility of service beyond the resources of any individual warehousing company. By combining sales and service functions in the TARS organization, with uniform warehousing policies and procedures, the five member companies are now in a unique position to provide coast to coast warehousing facilities for the frozen food and perishable products industries. Tariffs for service at each warehouse location are established independently by the individual companies.

Standing Operating Committee

TARS has set up a standing operating committee said to be composed of the five companies' most experienced and qualified men in the fields of food technology, research, refrigeration engineering, warehousing, traffic, distribution and office procedures. This committee reportedly has established uniform operating policies and standards for all member companies covering all phases of warehousing operations.

All TARS member companies are members of the National Association of Refrigerated Warehouses and The Refrigeration Research Foundation.

New Storage Plant

A SEVEN and a half acre tract has been acquired at San Leandro, Calif. by Oscar Mayer & Co., food products packer Madison, Wis., as the site for a new branch distribution and refrigerated storage plant.

Frozen Food Conventions

SPECIFIC dates and cities for the next two national sales conventions of the National Frozen Food Merchandising Association are announced for the fall of each year as follows:

1957: September 8-11 — Chicago, Hotels Sherman and Morrison.

1958: October 26-29 — New York, Hotel Statler.

In 1959, also the last week in October, the National Frozen Food Merchandising Convention and Exposition will return again to Chicago, according to William M. Walsh, convention chairman of the National Frozen Food Distributors Association which has undertaken the management responsibility of this annual industry gathering. Also participating will be the other leading associations of packers, brokers, warehousemen, suppliers and their individual members.

Since the first announcement last summer, that a shift to fall dates was being given committee consideration — reports to Chairman Walsh indicate a mounting approval for that season as the best possible for face-to-face business contacts. Not only are wholesale distributors and retail buyers of frozen foods better able to leave their own operations to attend a fall convention than at the peak months of late winter, but packers, brokers and suppliers all report they will be in the best possible position in September or October to announce future campaigns and business-building programs. Some companies advise they will use the September 1957 convention as an auspicious sounding board for breaking forth their complete 1958 programs.

This does not include processor personnel primarily interested in grower relations and plant assembly lines, particularly in the West Coast fruit and vegetable operations which are only shut down in January and February. Their needs for swapping technical know-how will be taken care of by the early March 1958 convention of the National Association of Frozen Food Packers.

Registration desks will open Saturday, September 7, in the main lobby of the Hotel Sherman when committee sessions will get underway. Sunday afternoon will see the opening of the 200 booth Exposition utilizing the complete mezzanine level of the Sherman, much of the space already having been spoken for by leading packers and suppliers. The All-Industry Reception Sunday afternoon will be at the Hotel Morrison.

Practical Refrigerating Engineer

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Operating engineers of all refrigerating plants are invited to affiliate with the National Association of Practical Refrigerating Engineers, Inc., an educational association, "not-for-profit".

From the President's Desk

Regional Meetings Gain Favor Start Industrial Membership Drive

ONCE AGAIN a small chapter in membership has proven to be large in energy. On April 26, 27 and 28 the Milwaukee Chapter presented an outstanding program loaded with educational features that would do justice to any chapter regardless of size of membership. Congratulations to each of the members in this chapter responsible for that exceptional meeting.

On behalf of the entire membership of the NAPRE this space and opportunity is taken to thank all the manufacturing, contracting and supply company sponsors for their cooperation in helping to make this Midwest Educational Conference a huge success. Special thanks to the Honorable Mayor Zeidler of Milwaukee for his attendance and encouraging speech. Also to President Karl Werwath, Milwaukee School of Engineering, and Ward C. Stoner, Vice-President, Ben Hur Manufacturing Co., chapter founder, for their continued activities in NAPRE's behalf.

More Conferences

On June 1 the five Chapters of the Pacific Northwest held their first post World War II educational conference. Tacoma, another relatively small chapter on a membership size comparison basis, but large in activity, was Host. Mort E. Bell, Director, NAPRE, was coordinator of all chapter effort for the meeting, as well as instigator of the whole idea. Reports on the program will appear in the next issue, but the important fact to note here is the ambition, ability and interest of our smaller units.

Tampa, Florida, Chapter is next Host to a conference. Chapter President Bob Seiden recently visited the National Office to get the lowdown on costs and experiences of other regions and chapters. An announcement is expected in the July INDUSTRIAL REFRIGERATION which will give dates and list the participating chapters.

National Meeting at Chicago

Chicago Chapter is concentrating all efforts on making the 48th Annual Meeting one of the most outstanding in NAPRE's history. As Host the Chapter has undertaken a bold new idea in raising funds for offsetting local transportation costs for field trips and to All-Industry Show, from the hotel sites. The same plan is *hoped* to be adequate enough to eliminate any registration costs to members, other than the socials.

Attendance Award

An outstanding attendance award has been donated to NAPRE by Ben-Hur Mfg. Co. of Milwaukee. One of Ben-Hur's latest home freezer storage cabinets, chest type, is the top attraction. Another freezer chest, smaller, has been offered by the Host chapter itself. Still a third award will go to a member or guest registering between November 17 and 21.

Although the Educational Fund will suffer severely by holding the Convention simultaneously with the All-Industry Show (it's hardly likely that we can compete exhibit-wise), it is believed that members will gain in their knowledge of equipment from show attendance. Already, your officers have anticipated this loss in revenue and curtailed some services from the National Office for the balance of the fiscal year.

Industrial Memberships Can Bolster Educational Funds

Each Chapter has received sufficient data, new brochures, and applications for enrolling or renewing Industrial Memberships for the 1958 term. Deadline is October 1. Efforts of each member to interest operating firms, manufacturers, contractors, and suppliers, to more actively participate in NAPRE, will largely determine the extent of our Educational Services in 1958. Guy R. King's paper on the new refrigerant numbering system, and the circular on liquid return systems, both circulated recently, are examples of extra benefits available through the participation of our Industrial Members. Haven't received yours, yet? See your Chapter Secretary. He was to have mailed them to you.

Chapter Award

Detroit moved in again on the Chapter Report Award. In the opinion of the award committee they did the best job of reporting — even enclosed a manuscript. However, space for reprinting is at a premium and their report is unfortunately reprinted herein in condensed form.

Bert C. McKenna

ANOTHER KRAMER MAJOR ACCOMPLISHMENT

NEW LOW COST 30
ENDS FRESH FOOD S

KRAMER TRENTON COMPANY UNFOLDS A NEW CONCEPT OF REFRIGERATION APPLICATION FOR FRESH FOODS

For many years, research and experience in the fresh food storage field have emphasized that most fresh foods (meats, fruits, vegetables and dairy products) can be kept in a salable condition for considerably longer time when stored at 30° to 32° with a minimum of temperature and humidity variation.

The "off-cycle" defrost currently used in fresh food coolers makes it impossible to obtain ideal storage conditions. By eliminating the "off-cycle" defrost a new concept of refrigeration unfolds, offering tremendous potential savings to the operator of cold storage equipment.

The new "F" THERMOBANK ("F" for fresh food), the latest Kramer addition to its line of advanced devices for the refrigeration industry, is designed to eliminate "off-cycles" so as to maintain the desired temperature and humidity with little fluctuation at any storage temperature, whether it be 30° or 36°.

THE "F" THERMOBANK IS THE IDEAL ANSWER— More than a decade ago, Kramer called to the attention of the refrigeration industry that THERMOBANK is not only ideal for frozen food storage, but is equally ideal for the storage of fresh foods at a 30° to 32° level which is not possible with the "off-cycle" system.

Over the years, a number of installations have been made with the standard low temperature THERMOBANK in fresh food coolers at 30° to 32°. This resulted in a rich accumulation of technical and field experience at this temperature level and resulted in the development of the "F" THERMOBANK for the specific task of maintaining temperatures in the 30° to 32° level. For temperatures below 30°, "M" or "L" THERMOBANK should be used. The "F" THERMOBANK has been thoroughly and carefully tested in the laboratory and field, and it retains all the recognized advantages of the re-evaporative hot gas defrost which has been successfully used in thousands of THERMOBANK systems over many years. The "F" THERMOBANK offers great economies of initial and operating cost.

EXTRAORDINARY ECONOMIC ADVANTAGES OF THE "F" THERMOBANK

It is now possible to design a system for the storage of fresh food at optimum conditions of 30° to 32° with all the advantages of this low storage temperature. These include less waste, longer shelf life, less dehydration, less mold and bacterial infection, and maintenance of "freshness" for longer time. It is also possible to obtain close control of temperature, reduce fluctuations in temperature and humidity with the fewest possible defrost periods of shortest possible duration.

To accomplish a complete defrost with an "off-cycle" system the equipment must stand idle ("off-cycle") eight hours of each 24 hour period; thus the refrigeration is limited to approximately 16 hours and the

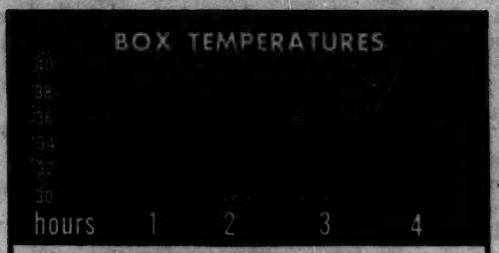
"F" THERMOBANK STORAGE PROBLEMS

equipment must be sized large enough to handle the maximum daily load in 16 hours.

Because the "F" THERMOBANK guarantees rapid and complete defrost, equipment is safely selected for 20 hours operation. This results in the selection of smaller coils and smaller compressor for a 30° "F" THERMOBANK installation than that required for an "off-cycle" system at 35° for the same cooler. Indeed, even at the 34° to 36° level, careful economic comparisons indicate that the "F" THERMOBANK would be a more desirable equipment selection than the old "off-cycle" defrost system for the simple reason that with the "F" THERMOBANK temperature fluctuations can be kept at a minimum; the length of time for defrost can be drastically reduced; and all of this accomplished with possibly lower, but certainly no higher, first cost and certainly no higher operating cost.

The THERMOBANK is time-tested, field tested and has an enviable record of history-making in the low temperature field. The "F" THERMOBANK is enthusiastically recommended for the fresh food range with complete confidence and an assurance of high performance and quality characteristic of Kramer equipment.

The selection and application of the "F" THERMOBANK is as simple as the old "off-cycle" system and has an additional margin of safety in estimating the load because the defrost is positive, complete and rapid. Selection tables covering a wide range of cooler sizes for 30° applications are available.



FIELD TESTS PROVED MARKED ADVANTAGE OF "F" THERMOBANK

Top Curve describes a typical "off-cycle" system: 30 minutes on cycle, 15 minutes "off-cycle". Equipment must be selected for 16 hour operation to obtain defrost. Temperature and humidity conditions continually changing.

Bottom Curve describes a typical "F" THERMOBANK system: 170 minutes refrigeration cycle, 10 minutes defrost cycle. Equipment selected for 20 hour operation. Temperature and humidity practically uniform 'round the clock.

WRITE FOR BULLETIN TV-380

KRAMER TRENTON CO. • Trenton 5, N.J.

43 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

Maintenance

Principal Theme of NAPRE Conference
Milwaukee Chapter Host to Midwest Chapters

FIRST Regional Educational Conference of the 1957 NAPRE season was held on April 26 through April 28 at Milwaukee, Wisconsin. That city was host to Midwest Chapter delegates, members and guests from Green Bay, Twin Cities, Sioux City, Chicago, Indianapolis and Detroit. Members-at-Large attended from the states of Wisconsin, Minnesota, Iowa, Illinois, Indiana and Michigan.

Conference Opened Friday

The conference opened at noon on Friday, April 26, with registration and reception. At 2:00 p.m. conference attendants, under the leadership of NAPRE Vice-President, Roy T. Burns, Assistant Educational Director, Eugene Rytlewski and Tour Chairman, S. A. Tomkowiak, toured Vilter Manufacturing premises. They were welcomed at Vilter by President A. A. Silverman, Vice President A. O. Voegel and staff. The visitors toured the manufacturing firm's foundry, machine shops, assembly facilities and test center, as well as the administrative offices.

Friday evening activities were given over to a combined tour and social at the Miller Brewing Company. Ladies and gentlemen toured the refrigerating plant and cellars at Miller's prior to a hot buffet dinner treat in the brewery hospitality center. Although many of the members were aware of the Miller Brewing Company production, they were quite surprised at the large amount of connected horsepower and refrigeration tonnage used for processing. Of particular interest was the double-ended duplex double-acting horizontal, high-speed Worthington compressor in the main engine room. Many expressed amazement at the fact that the machine was used in compound operation without an intercooler between stages.

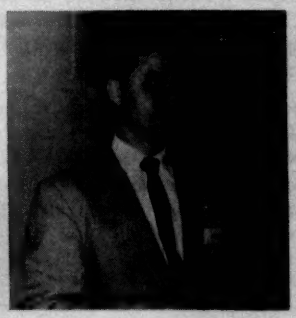
—THE EDUCATIONAL COMMITTEE, NAPRE.

As an educational not-for-profit Association, one of NAPRE's objectives is to encourage and foster regional conferences such as was held April 26-28 at Milwaukee, Wisc. Therefore, the practical paper scheduled for this space this month is held over to give place to a detailed report of that Midwest Educational Conference. Another installment in the series on the Prevention of Refrigerating Plant Failures will make its appearance with the July issue.

Educational Sessions

Milwaukee Chapter President John Alberte of the Schlitz Brewing Company, opened the Saturday sessions with a brief welcome and introduced Father J. L. Stanton of the Theological Department of Marquette University, who gave the invocation. Following the invocation Alberte introduced the national officers in attendance. They were Bert C. McKenna, National President, and production engineer for Midwest Dairies; Roy T. Burns, Vice-President, and City inspector, Detroit; Eugene Rytlewski, Assistant Educational Director, and refrigeration engineer, City Products Corp.; and, J. Richard Kelahan, National Secretary and technical editor of INDUSTRIAL REFRIGERATION. Following the introductions the ladies

Milwaukee Chapter President John Alberte of the Schlitz Brewing Company calls the Midwest Regional Educational Conference of NAPRE to order on April 27. Milwaukee was host to six other Midwest NAPRE chapters at a 3-day weekend conference



Kick-off speaker of the educational conference was Delbert W. Shobe, Assistant Sales Manager, Ideal Electric & Manufacturing Co. Shobe reviewed a work on synchronous motors and their controls which was published in Industrial Refrigeration, May 1957, page 35.

Assistant Supervisor of Inspection, A. S. Schneider, of the Hartford Steam Boiler Inspection and Insurance Company, presented the discussion on Refrigeration Plant Maintenance from the viewpoint of the safety engineer. Slides depicted some major derangements.

Chalk talks on the part of the operator's panel at recent Educational Conference were very common. Here, Eugene Rytlewski, assistant educational director helps with a suction trap problem. Seated at the table is E. C. Hamilton, Worthington Corp.

departed on a tour of spots of selected interest. They enjoyed a style show and luncheon at Gimbels Department Store at mid-day.

At this point Alberte introduced Charles H. Randolph, air conditioning engineer of Wisconsin Electric Power Company, an associate member of the Milwaukee Chapter, who served as educational chairman for the morning sessions. The conference presented four educational activities. The first speaker reviewed a paper on synchronous motors and their controls[1], the second discussed refrigeration plant maintenance from the eyes of the insurance inspector, a panel conducted a round table discussion on problems in refrigeration operation and upkeep, and the morning sessions concluded with a question-and-answer box on the previous topics.

First speaker presented was D. W. Shobe of Ideal Electric & Manufacturing Company, who reviewed the paper which was to have been presented by Robert J. Crawford, service manager of the same firm. Shobe explained that Crawford had been unexpectedly called to Caracas, Venezuela on a trouble shooting mission. In presenting the topic, Shobe emphasized the four advantages offered by synchronous application to reciprocating compressors. He also described the five methods of excitation for this type of apparatus.

Flywheel effect seemed to be one topic which most practical engineers misunderstood, according to reports reaching his firm, Shobe stated. Therefore, he dealt with the expression, WR^2, the mathematical designation of flywheel effect. He explained how W represented weight and R the radius, and pointed out that this formula applied, improved or smoothed out any irradicate movement caused by reciprocating parts in the compressor.

Power Factor Discussion

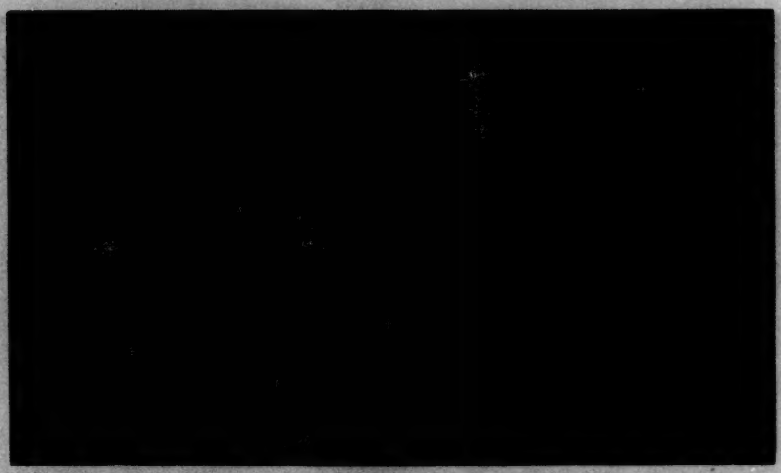
Power factor was another problem that the practical engineer apparently had difficulty in understanding. The speaker went into a brief explanation of the effect of power factor on the plant and described when to use unity power factor motors. He also described when 0.8 power factor motors are used in preference to the unity types. He explained how to set unity power factor motors at 0.8 should the situation develop in the plant net-work which would require such operation. He used charts to illustrate power factor correction and to compare power factor of two synchronous motor types.

Further described in the discussion was the monthly routine of inspection and maintenance. Then the speaker got into a detailed discussion of annual maintenance or overhaul, including insulation testing. Of particular interest in the overhaul description was the use of an air gap measuring gauge. Shobe described this tapered device and its use (see figure on page 36).

In addition to discussion of check points in the annual overhaul of synchronous motors and their switch gear, the speaker discussed the use of certain solvents and mentioned the type being used by his firm at their manufacturing plant. The safety of solvents was not only emphasized from the standpoint of fire or explosion hazard but also from toxic or poisonous viewpoint.

Plants Lack Test Devices

In the discussion period which followed it was brought out how many plants do not have adequate insulation testing devices. Regarding one of the more common but previously considered a rather expensive type, it was mentioned that their cost was now down to about $150.00 However, the speaker pointed out that the small portable plastic case megohmmeters of the battery powered type are now available in the price vicinity of $50.00.



Panel which handled the open discussion of problems in refrigeration plant operation and upkeep at the recent NAPRE Midwest Conference. Left to right: Irv. Kloth, refrigeration and air conditioning application engineer, York-Wagner Company, Milwaukee; Eugene Rytlewski, refrigeration engineer, City Products Corp.; Bob Hoffa, field engineer, service department, Trane Co., LaCrosse, Wisc.; E. C. Hamilton, manager air conditioning and refrigeration service and repairs, Worthington Corp., Ampere, N.J., and, Richard T. Murphy, chief engineer, Bassett Refrigeration Co., Appleton and Green Bay, Wisc.

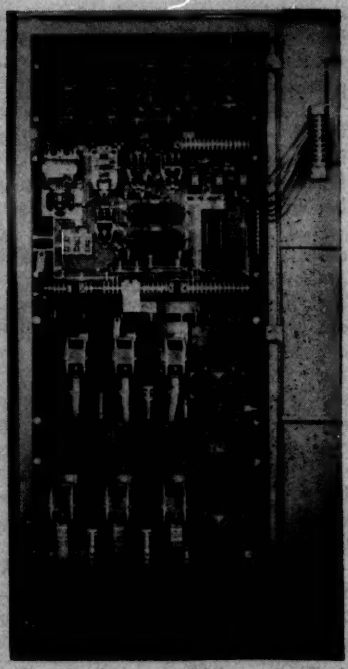
Insurance Inspector Talks

The next speaker was A. S. Schneider, Asst. Supervisor of Inspection, Hartford Steam Boiler Inspection and Insurance Co., Chicago. Schneider tackled the topic of refrigeration plant maintenance from the viewpoint of the insurance inspector. He cited a number of instances of plant failures, discussing the cause in each case and how it could have been prevented through proper maintenance procedures, safe operating practices or compliance with codes in the design or installation. His presentation was all the more effective when it was pointed out by NAPRE's National Secretary that several of the case histories cited were actual instances of accidents to NAPRE personnel or plants manned by newer NAPRE members.

High on the list of accidents were those due to welding failures. In one instance, the head off of a large receiver penetrated through a six-inch brick wall. The speaker pointed out that most failures were due to lack of penetration or porosity of the weld with the base metal, while in some instances there had been failures to weld from both sides or with a backing strip on pressure vessels.

Another cause of plant failures was due to lack of relief devices. Two men were killed due to this cause in one instance alone. The

[1]This is the paper published in detail in the May 1957 issue of *Industrial Refrigeration* under the title "Give Synchronous Drives Their Proper Care"; page 35.



Above, a maintenance electrician checks the air gap gauge of a large synchronous motor. This method of checking the air gap was described in detail by D. W. Shobe in the first paper presented before the Milwaukee Regional Conference. It was explained to conference attendants that the length of the tapered gauge could be measured very easily and compared with a set of tables which would show the air gap clearance between the stator and rotor. Note the length of the gauge chalked on the stator guard at the time the machine was disassembled for extensive overhaul. The same data was logged by the engineer at the time of dismantling in order that a record would be available for comparison purposes when the machine was reassembled.

At right, a view of the reduced voltage starter customarily found where a large synchronous motor is employed in larger refrigerating plants. The speaker discussed annual maintenance of such equipment.

speaker suggested that the only safe practice was to protect any vessel which could be isolated from the main system, with relief devices. This led into discussion of how often relief devices should be tested and overhauled. When it was suggested that they should be tested and overhauled or replaced if found faulty at least once a year, a number of those in attendance expressed surprise.

During the question and answer session a poll was made of those in attendance and it was found that less than one-third followed the practice of overhauling relief devices on an annual basis. Apparently those who did so, went about it because of compulsion—they had to certify to the local inspection service or regulatory body that they tested the relief devices in order to get a renewed certificate or license.

Condensers As Derangement Causes

The speaker also pointed out a number of plant failures due to lack of condensing water, or stoppage of condensing water. He also pointed out a number of instances where they had run across excessively high condensing pressures which were due to other items than insufficient condensing water. In most cases it was due to non-condensables in the system, although in a few occasions insufficient condensing surface was responsible.

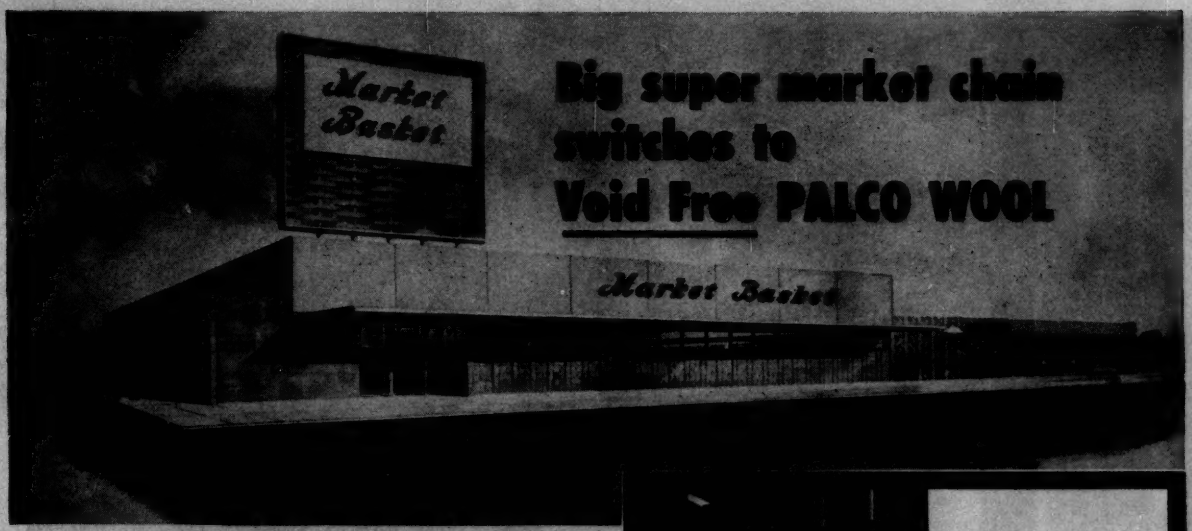
Schneider pointed out the fallacy of economizing on thermometers in the refrigerant and water lines. These indicating instruments serve the operating engineer in much the same manner that the stethoscope and blood pressure apparatus serve the physician in his check of the human system.

Air conditioning applications came in for their share of accident citations. In this discussion moisture contamination of the fluorocarbons received considerable attention. It was pointed out that permitting one drop of water in one pound of Refrigerant-12 was courting disaster. Although this amounted to as little as .0046 percent at 20 F, it could allow a good acid condition to get started in a system. The speaker suggested blowing out refrigerant systems with CO_2 following overhaul, and suggested that there are adequate drying agents available commercially to remove most residual moisture following pump down with vacuum pumps which are also commercially available.

The refrigerant discussion, of course, included some references to ammonia. The speaker stated that at the risk of repetition he would point out an 11 to 26 percent concentration by volume constituted a combustion hazard, and that 13.25 to 26 percent constituted an explosion hazard. He emphasized care in handling of this refrigerant and adequate ventilation with any refrigerants which had escaped the system or charging container.

Damaged Compressors

Compressor failures in recent years, it was pointed out by the speaker, have occurred mostly in air conditioning applications. And strange to relate, he stated, that there didn't seem to be any greater frequency with one refrigerant than another. The various fluorocarbons, carbon dioxide and other refrigerants had no bearing on the failures. One in three instances appeared to be due to valve failures. These failures apparently resulted from poor inspection at the time of regular



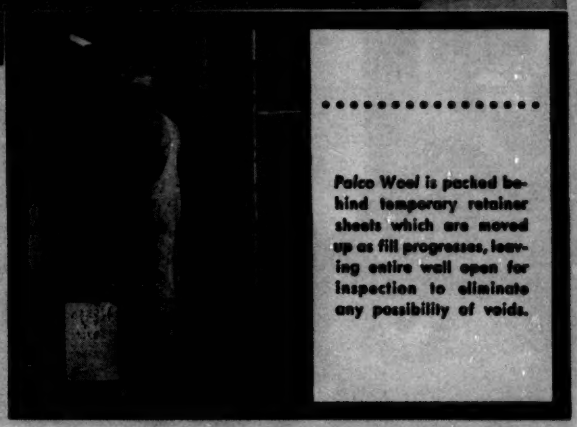
Big super market chain switches to Void Free PALCO WOOL

This Tustin, California unit is one of approximately 10 huge Market Basket Stores recently completed, in construction or planned for the near future—each with 7 freezer and cooler rooms insulated with Void Free Palco Wool.

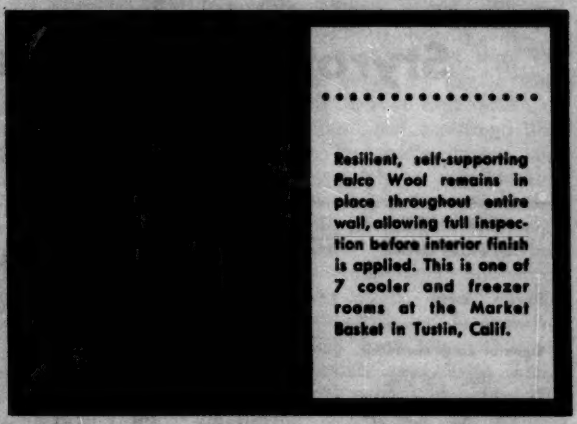
5 newest markets and 5 more scheduled with Void Free PALCO WOOL insulation in over 70 large freezer and cooler rooms

Recognized among the largest, most modern de luxe super markets in the nation, 38 Market Basket Stores have gained wide experience with many types of low temperature insulation. In all of their recent and planned installations, Market Basket now specifies *Void Free* PALCO WOOL—the Underwriters' Laboratories labelled insulation that combines all these advantages:

- No cracks
- No joints
- No convection loss
- No pockets
- No settlement
- No trapped moisture
- No shrinkage
- No leaks
- No deterioration



Palco Wool is packed behind temporary retainer sheets which are moved up as fill progresses, leaving entire wall open for inspection to eliminate any possibility of voids.



Resilient, self-supporting *Palco Wool* remains in place throughout entire wall, allowing full inspection before interior finish is applied. This is one of 7 cooler and freezer rooms at the Market Basket in Tustin, Calif.

SEE THE NEW REFRIGERATION INSULATION MANUAL IN SWEET'S INDUSTRIAL CONSTRUCTION FILE OR SEND COUPON AT RIGHT FOR YOUR FREE COPY

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PALCO INSULATION Wool

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Please send me, without obligation:

- ☐ New complete Refrigeration Insulation Manual
- ☐ Sample of *Palco Wool* Insulation
- ☐ In-place test data on insulated structures

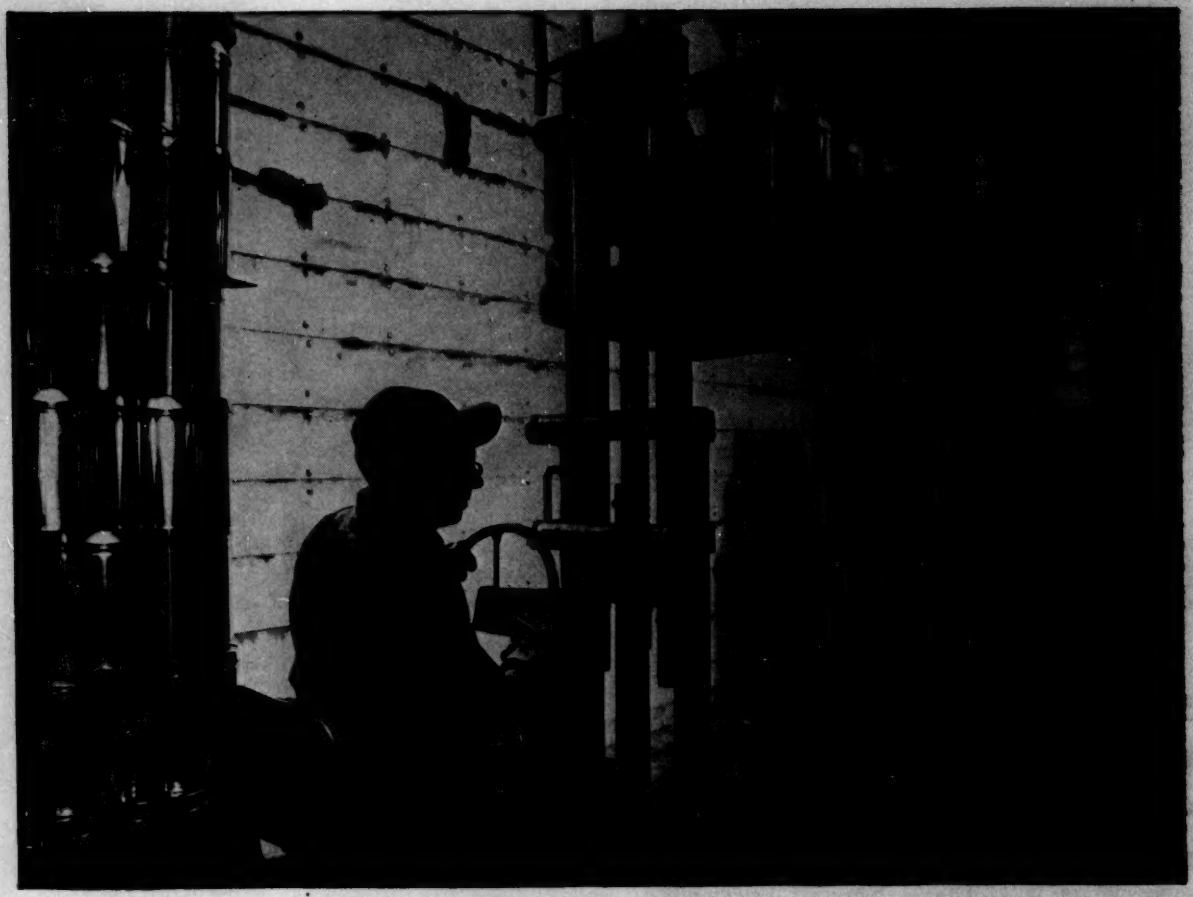
Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____



Styrofoam* gives best combination of insulating properties

COMPARE STYROFOAM	INSULATIONS			
	STYROFOAM	A	B	C
Low "K" factor	X		X	X
Superior water resistance	X	X		
High compressive strength	X	X		X
Light weight	X		X	
Superior resistance to rot and vermin	X	X		
Easy handling and fabrication	X			
Low-cost installation	X		X	
Lowest cost per year service	X			

Permanent "K" factor average, 0.25. Avg. density, 1.8 lbs. per cu. ft. No odor. No food value. Pleasant to work with. Fabricates with common tools. Does not crumble or settle.

Northern Cold Storage speaks from experience—

Since 1950, The Northern Cold Storage Company, Bear Lake, Michigan, has used over 300,000 board feet of Styrofoam (a Dow plastic foam). Its many outstanding properties have satisfied the most exacting demands for low-temperature insulation. Northern's Plant Engineer Burley reports particular satisfaction with the low "K" factor and the way Styrofoam does not absorb water. When Northern expanded in '51 and again in '56, experience made Styrofoam a necessity. For Styrofoam data, write THE DOW CHEMICAL COMPANY, Midland, Michigan – Plastics Sales Department PL1704C-1.

*Styrofoam is a registered trademark of The Dow Chemical Company.

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Tampa: The Soule Co.

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ILLINOIS
Chicago 11: The Putnam Organization, Inc.

IOWA
Des Moines: Wilson-Rogers, Inc.

KANSAS
Kansas City: Styro Products, Inc.

MASSACHUSETTS
Ipswich: Atlantic Foam Products Co.

MICHIGAN
Detroit: Par-Foam, Inc.
Midland: Floral Foam Products

MINNESOTA
Minneapolis 8: Edward Sales Corp.

MONTANA
Billings: Madden Construction Supply Co.

NEW YORK
Rochester 20: William Summerhays Sons Corp.
Long Island City 1: Styro Sales Co., Inc.

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Cincinnati: The Seward Sales Corp.
Cleveland 3: Structural Foams, Inc.

PENNSYLVANIA
Plymouth Meeting: G & W H Corson, Inc.

TEXAS
Houston: The Emerson Co.

UTAH
Salt Lake City 10: Utah Lumber Co.

WASHINGTON
Seattle 9: Wiley-Bayley, Inc.

WISCONSIN
Milwaukee: S & S Sales Corp.

CANADA
Edmonton, Alberta: Northern Asbestos & Bldg. Supply Co., Ltd.
Kitchener, Ontario: Durofoam Insulation, Ltd.
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THE DOW CHEMICAL COMPANY
Midland, Michigan

overhaul. Of course, the initial start of a failure came about through abusive or faulty operation.

Methods of making repairs were touched on briefly and more questions came up during the discussion sessions which followed. One item was emphasized in particular by the speaker and that was to never weld on a shaft. Metallock or metal spray was recommended until such time as a replacement shaft was obtainable. The speaker discussed uses of strain gauges for detecting distortion and fatigue. Magnaflux, white wash and red dye methods of crack detection were also discussed. It was also brought out that more and more discharge relief valves in the outlet line from the compressor are now being piped to the atmosphere and discharged through a proper type diffuser. This method of piping is preferred over returning such outlets to the suction inlet of the compressor.

Panel Tackles Questions From The Floor

Problems in refrigeration plant operation and upkeep were discussed following a coffee break. This discussion was handled by a panel headed up by R. T. Murphy, chief engineer of the Bassett Refrigeration Co. of Appleton and Green Bay, Wis. The other members of the panel were E. C. Hamilton, manager of service and repairs, refrigeration and air conditioning division, Worthington Corp., Ampere, N.J.; Eugene Rytlewski, refrigeration engineer, City Products Corporation, Chicago, Ill.; Irv. Kloth, application engineer, refrigeration and air conditioning, York-Wagner Co., Milwaukee, and Robert Hoffa, field engineer, service department, Trane Co., LaCrosse.

Problems

Problems submitted by the members present were assigned to various panelists who led the discussion on their assigned topic. Perhaps the subject receiving greatest attention was the one concerning slop-over protection for compressors. Consensus of the panel was to the effect that it was worse to trap a suction line in a refrigerating system without providing some means for removal of liquid, than it would be to have no suction trap at all. Chalk talks were utilized to show examples of unintentional piping traps due to poor design or improper field erection.

Another question which prompted considerable discussion concerned where the suction should be taken from a trap to a liquid transfer pump. Along the same line was a question involving where the discharge should be taken to a high pressure receiver from a liquid pump and where an equalizing line should be located or connected. The panel emphasized also the use of adequately large suction piping.

Equalizing lines between receivers and condensers also received considerable interest. A problem concerning a 100-ton system was submitted and members of the panel drew a comparison of correct pipe sizing between the condenser and receiver for both fluorocarbons and ammonia.

Moisture Problems Discussed

Moisture removal from hermetic centrifugal compression systems came up for discussion. Vacuum type pumps for evacuating moisture from low pressure systems were also discussed and several types were recommended by the panel. The question also came up during this portion of the panel session concerning how insulation resistance can be tested in the new type hermetic compressors.

On safety topics, the panel answered a number of questions concerning solvents which could be considered safe for use in cleaning refrigeration systems, components and electrical apparatus. Among some of the solvents recommended were the new types developed by the "Freon" Products Division of DuPont.

Relief valves and bursting discs were among the safety devices discussed. Apparently a considerable number of the engineers were having difficulty with bursting discs located in pressure vessels of fluorocarbon centrifugal compression water or brine chilling units. Some of the troubles were attributed to cracking which resulted from alternate vacuum and pressure periods to which the vessel was submitted as a result of having protracted idle periods. One manufacturer indicated that they now use a relief valve followed in series by a bursting disc. The bursting disc in this instance is installed as a check against a "weeping" relief.

Following the operation upkeep session, the previous speakers were called back to the platform, summaries given of their presentations and a question and answer session followed in which the five panelists, as well as the two speakers participated. Following the question box session, the educational discussions were adjourned.

Tour New Dairy

At mid-afternoon members and guests toured the Luick Company, Division of Sealtest Dairy. This is the newest dairy plant in this area, actually consisting of two separate plants, an ice cream manufacturing plant and a milk processing plant. The milk plant was reported on in detail in the July 1956 issue of INDUSTRIAL REFRIGERATION, pages 13 through 19. The tour was conducted by Larue Johnson, Luick's chief engineer, Harold Kuehlhorn, milk plant engineer, and Roy A. Espe, Burge Ice Machine Co., contractors. Arrangements for the tour were through the courtesy of Mr. R. W. Morrison, vice-president of Luick's.

Social Activities

Social activities for the conference were brought to a close with three evening activities. There was a cocktail hour followed by a dinner meeting. Dancing was enjoyed following the dinner meeting.

Two speakers shared honors at the dinner meeting. Karl Werwath, President of Milwaukee School of Engineering, made a short address, complimenting NAPRE members in the interest which they show in self-improvement. Werwath, it was pointed out by one of the Milwaukee Chapter's original founders, C. Ward Stoner, Vice-President of Ben-Hur Mfg. Co., has been an unofficial sponsor of NAPRE activities in that city. The Milwaukee Chapter, NAPRE, meets in the Milwaukee School of Engineering, through the courtesy of President Werwath. Werwath extended an invitation to the local chapter to continue meeting in the school and extended these courtesies by inviting the chapter to hold its next regional conference at the school, as well.

Milwaukee Mayor Speaks

Principal speaker was the Honorable Frank Zeidler, Mayor of the City of Milwaukee. Zeidler, who is a practical engineer himself, extended the courtesies of the city to the delegates, members and guests in attendance. He reviewed briefly his own engineering experiences and went on to elaborate on the contributions which the practical engineers had made to the growth and development of Milwaukee, the state and the midwest area. National and local officers learned from the Mayor that they had many mutual friends and interests in the refrigeration and air conditioning field. Members in attendance were amazed that the political head of a metropolitan area would be as well versed in refrigeration and air conditioning as the Mayor appeared to be.

Another compliment extended to the conference attendants came from C. H. Randolph who had moderated the morning sessions. Mr. Randolph commented as follows: "As a member of several engineering societies I've attended many national annual meetings as well as some regional and many local meetings. Occasionally I've seen a paper or speaker able to hold the complete attention of the audience for perhaps an hour. Those attending the meeting last Saturday gave complete attention to both hour long papers plus the panel discussion, all told nearly four hours. I was deeply impressed by the intense interest and obvious desire to learn and help each other shown by those attending the technical sessions."

Committees and Sponsors

Although Milwaukee chapter was the host for the Midwest Regional Educational Conference, the conference committee itself was composed of Leland J. Anderson, as chairman and R. A. Graves, as treasurer. Mrs. Anderson headed up the ladies' committee. John Alberte was responsible for the speaker arrangements; S. A. Tomkowiak, chairman of the tour committee, and Harry Behmke was responsible for the program. Anderson is actually the secretary of Milwaukee Chapter. Alberte is chapter president, Tomkowiak and Behmke, each vice-presidents. The sponsors who assisted the committee in carrying the financial load for the conference were Hubbell Corporation, Mundelein, Ill., Wisconsin Refrigeration Supply, Refrigeration Parts Company and Armstrong Cork Company, all of Milwaukee, H. A. Phillips Company, Chicago, The Electric Co., Milwaukee, Herman Goldberg Company, Chicago, and Ben-Hur Mfg. Co., Milwaukee.

Safety Award Presented

AN AWARD signifying a year of operations without an injury accident was presented recently to Carl Cramer, plant manager of the Bakersfield, Calif. plant of the Pacific Fruit Express Company. The award was presented by V. K. Plummer, vice-president and general manager of Pacific Fruit Express. This is the third such award won by the Bakersfield plant. The employees worked 125,888 man hours in 1956 without a mishap. Eighteen other branches of the company received 1956 safety awards.

NAPRE

Question Box

The National Educational Committee, NAPRE, answers monthly in this column, operating problems forwarded by members. The Committee appreciates answers from the field. Address questions and answers to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif.

Literature on Ammonia vs. "Freon" Installations

QUESTION No. 1173: Could you suggest available literature which may discuss the merits pro and con of ammonia and "Freon" installations for plants of approximately 50, 100, and 200-ton capacities. In addition to dressed beef operations our firm also packs frozen meats.—N. S., N. Jersey.

ANSWER: Refrigerants, whether ammonia or fluorocarbons should not be selected from the standpoint of plant size, but rather from the attitude of application. For example, in the 25 horsepower size, NH_3 would probably be used for ice cream freezing while Refrigerant-12 would most probably be used for comfort air conditioning.

It is true that very small systems (less than 10 hp) generally use fluorocarbons because of the applicability of copper pipe and coils, which are more easily assembled. However, it is not true that the fluorocarbon systems should be limited to any size. In the air conditioning of office buildings many such systems have capacities greater than 1000 tons.

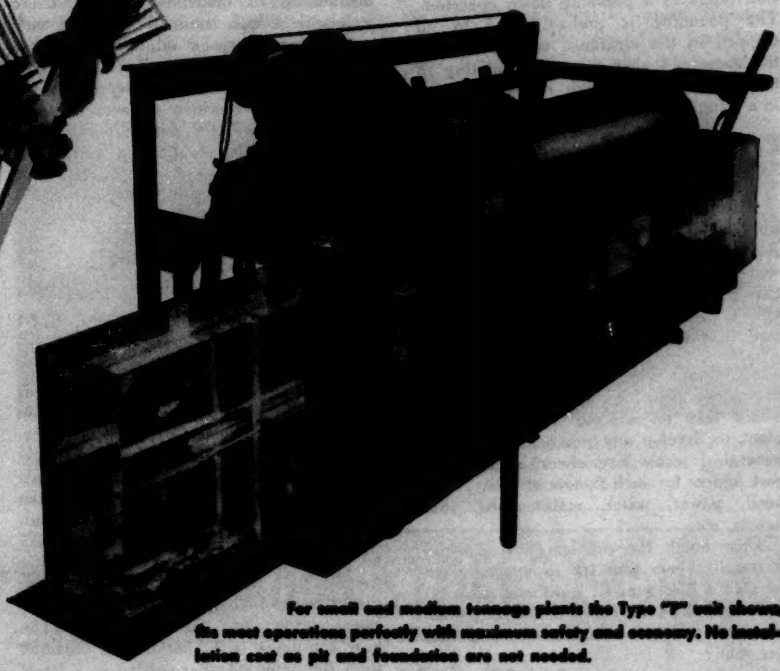
From the standpoint of suitability for various types of application, listed below are properties* from which the engineer can make a suitable judgment.

1. Toxicity
2. Inflammability
3. Chemical activity
4. Effect on refrigerated produce
5. Odor
6. Oil solvent properties
7. Cost
8. Pressure-volume-temperature characteristics
9. Power required per unit of refrigeration
10. Heat transfer rate.

Of the above factors, No. 10, heat transfer rate, is the most important factor in favor of ammonia. Much higher heat transfer rates can be achieved with ammonia than with any of the fluorocarbons. The film conductance for evaporating ammonia in a well designed flooded system is often as high as 1000 Btu/(sq ft) (hr) (°F)

*These properties are discussed in detail in *Refrigerating Principles and Practices* by Norman Sharpe.

Tops in ice scoring...



For small and medium tonnage plants the Type "F" unit shown fits most operations perfectly with maximum safety and economy. No installation cost on pit and foundation are not needed.

GIFFORD-WOOD TYPE "F" SCORING MACHINE

G-W ICE TOOLS

A complete line of top-quality hand-tools . . . tongs, hooks, shavers, bars, chisels, etc. . . . designed to make manual handling of ice easy and safe—made tough to stand the gaff of years. Write for Bulletin No. 480.

"Our Type 'F' Scorer has been in constant use for nearly 14 years and has... given the best service of any piece of equipment we have bought since we started in business in 1906."

We think this statement from one user speaks volumes for the quality of the Gifford-Wood Type "F" Scoring Machine. It is a rugged unit, precision-built to do a clean, even scoring job over many years—with a minimum of maintenance.

One-man operation of a G-W Type "F" Scorer delivers three or more 300- or 400-lb. cakes per minute—either in the storage room or on the platform. Completely portable, no hold-down bolts needed.

For full information on other types of ice scorers manufactured by Gifford-Wood, write for Bulletin 116A.

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Pacific Coast Representative: Western Ice Equipment Company, 420 Market St., San Francisco 11

while with the fluorinated-hydrocarbons the evaporating film conductance is usually between 200 and 400 Btu/(sq. ft.) (hr) (0 F). It is probably this factor more than any other that keeps NH_3 as a steady competitor to the newer fluorocarbons.—H. P. Hayes.

Pounding in Compressor

QUESTION No. 1174: What does a pounding sound in the compressor, when a vacuum is being produced, indicate?—H. W., DePere.

ANSWER: It is presumed that the question refers to a pumping down operation. The pounding is probably due to oil trapped in the clearance volume. This is the same old story of oil circulating in the system and showing up in this case in a "slug".—H. P. Hayes.

Power Rates Increased Stimulating Efficiency Moves

QUESTION No. 1175: On December 1, 1956, power rates in the Los Angeles area for a 50-ton ice plant were increased about 15 percent. How can plant efficiency be stepped up to effect enough savings to off-set the rise in power rates?—F. H.

ANSWER: The editor warned me not to write a book on this one. Actually, it would take an analysis of your specific plant to develop any practical answer. In general, I would first check all available cost figures for such factors as labor, overhead, power, water, maintenance, shut downs, etc.

Then break the problem into a series of smaller ones and try to analyze each in detail. Ask yourself questions such as:

Have I used as many labor saving devices as possible to increase my output per man?

Is my equipment in the best possible condition?

Are there one or two operations which slow down my total production? If so, how can I improve these and by so doing improve my total operation?

Is there any possibility of passing the cost increase on to the customer, etc?

Most of the standard refrigeration texts have chapters on improvement of operating efficiency. INDUSTRIAL REFRIGERATION has, of course, published a number of articles on this subject.

You may have already thought of submitting your plant analysis to your NAPRE chapter as a class project. If not, it would be a good possibility.—H. P. Hayes.

Obtaining Temperatures of Liquid Refrigerant

QUESTION No. 1176: What is the best method of taking the temperature of a liquid refrigerant in a pipe when no thermometer well is available?—L. W., Oshkosh.

ANSWER: A satisfactory method of measuring the liquid refrigerant in a pipe can be established by the use of a glass-stem thermometer, a copper tube, solder and insulation such as cork or styrofoam. The copper tube should be selected to fit the thermometer stem, and be as long and as thin walled as is practical.

The lower end of the tube is closed to form a well. The tube is attached to the pipe by means of solder beads to form a solid metal heat conductor between the pipe carrying the liquid and the tube. The entire pipe and tube should be well insulated with a minimum thickness of two inches if possible. The better the insulation, the less will be the temperature drop across the metals between the liquid refrigeration and the well.

This attached well is used in the same manner as an immersion well. Fill the well with a high conductivity liquid such as water, mercury, or oil. The thermometer is then placed in the liquid. The copper tube may be merely strapped to the pipe at some sacrifice of accuracy and sensitivity. The latter method may be satisfactory if only changes in refrigerant temperature are desired.—H. W., San Luis Obispo.

Effect of Rain on Evaporative Compressor

QUESTION No. 1177: Does rain have any effect on the capacity of an evaporative condenser?—E. W. B., Appleton, Wisc.

ANSWER: The mere fact that rain is falling does not result in any effect on an evaporative condenser. The heat exchange takes place between the hot gas in the condenser and the air being blown through the heat exchanger. When the relative humidity is less than 100 percent, the temperature of the atmospheric air can be reduced to that closely approaching the wet bulb temperature (which is lower than the dry bulb temperature) by evaporating water into the atmosphere. The heat consumed in evaporation is obtained from the entering air, resulting in a lower temperature.

When rain is falling, the relative humidity is close to or equal to 100 percent. The dry bulb, wet bulb, and dew point temperatures are all approximately equal. Lowering the dry bulb temperature by the use of the evaporation principle is impossible since, at 100 percent relative humidity, the atmosphere can take on no additional watervapor.

The lowest temperature possible for the cooling air in an evaporative condenser is limited by the wet bulb temperature. If the wet bulb temperature rises above the desirable minimum for use in the system, the result will be a reduction in the cooling capacity, whether rain is falling or not—H. W., San Luis Obispo, Calif.

Protecting Electric Lines From Moisture

QUESTION No. 1178: How can electric lines be run through cold storage rooms and freezers so as to avoid trouble with moisture accumulation and resulting deterioration?—E. R., Chicago.

ANSWER: All electric wiring should be run in solid conduit. Current flow through the conductors will result in some heat due to resistance. Any off-on cycle of operation will cause "breathing" within the conduit due to heating by the current and cooling by the cold room. An air tight seal between the conductors and the conduit can be placed at the entrance to the freezer or cold room. The wire is not sealed within the cold room. The breathing then will be that of the cold air which has a low specific humidity, and is usually less than 100 percent relative humidity. The drier cold air will be the air in the conduit, which will hold condensation to a minimum.—H. W., San Luis Obispo, Calif.

New Question

Code Stamp Weaken Vessel?

QUESTION NO. 1179: Safety inspectors use a punch to put marks and figures on receivers. Doesn't this weaken the shell? If so, why do they do it?—H. B., Pocatello.

Electric Insulation Value of Refrigerating Oils

QUESTION NO. 1180: I have seen reference to the dielectric strength of lubricating oils. What is dielectric strength and why is it important?—F. L. B., St. Louis, Mo.

Thermo-Valve, Control or Flow Equipment?

QUESTION NO. 1181: Our air conditioning instructor keeps saying that a thermostatic expansion valve is not a control, that its only function is to keep the right amount of refrigerant in the evaporator. It seems that it must be a control device, otherwise it wouldn't be adjustable.

Also, how do you know how much superheat an expansion valve should be set for?—L. E., San Francisco.

Simplified Reading Of Wiring Diagram Possible?

QUESTION NO. 1182: I sometimes have trouble reading wiring diagrams. Can you give me any pointers which will help? Is there any standard way of approaching a wiring diagram so that it can be read quickly? Maybe you could draw a simple diagram and explain the way a person should go about reading it.—N. M. D., Chicago.

Seeks Advice On Reducing Egg Mold

QUESTION NO. 1183: What methods are used to keep spoiling of eggs in cold storage to a minimum? One member writes that he has trouble with spoilage due to mold in particular. He would like to stop this if he can.—G. R. K., Los Angeles.

Ice Cream Texture Debated

QUESTION NO. 1184: This is an old argument but I would like an answer to it. Is there really any difference between hand-packed (from bulk containers) and pre-packaged ice cream? Some of my refrigerating friends say that it all comes out of the same machine so there shouldn't be any difference.—C. K., Edwardsville, Ill.

News Notes and Chapter Activities

Michigan Bell Program Puts Transistor Across to NAPRE

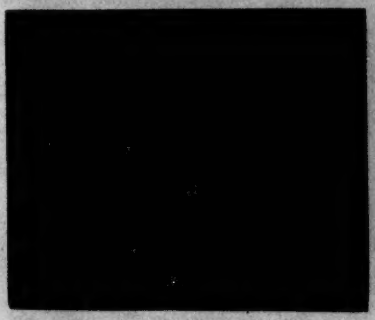
DETROIT—Determined to learn first hand just what transistors are and what they do*, NAPRE members in Eastern Michigan got their Chapter Program Chairman busy and located a lecturer to acquaint them with the subject. This unusual and interesting topic was discussed in a talk and demonstration of "The Fabulous Midget — The Transistor", by Gordon D. James, an engineer of the Michigan Bell Telephone Company, before the George B. Bright Chapter, NAPRE, on March 28.

Transistors are a development less than ten years old which are supplementing and replacing vacuum tubes. The transistor acts as a signal generator if it is energized with a small amount of current. James demonstrated this by wetting a small piece of blotting paper in his mouth, placed it on a silver coin (25 cent piece), and brought both in contact with an ordinary head phone or receiver. The wet saliva on the blotter piece provided enough acid to cause a chemical reaction between the silver and the blotter, which set up a small electric potential causing a current flow. The transistor in the hook-up amplified the current sufficiently to give off a very distinct sound signal in the head phones.

The speaker then gave a demonstration with a record player. In this experiment he used a transistorized preamplifier which was a built up unit consisting of two transistors and suitable capacitors and resistors which form a complete preamplifier occupying a space of anly 1½-x 1½-x 2-in. When this preamplifier was inserted in the circuit between the record player and the normal sound amplifier it gave just about double the tone volume.

James described and also demonstrated a signal generating unit which will be used to replace dial switching mechanisms on telephones. The dial mechanism consists of a unit with push buttons which produce a different sound for each button. The buttons are numbered and can be used like an adding machine instead of dialing phone numbers. The response is instantaneous and there is no delay necessary as in the case of existing relays used with dial-type systems.

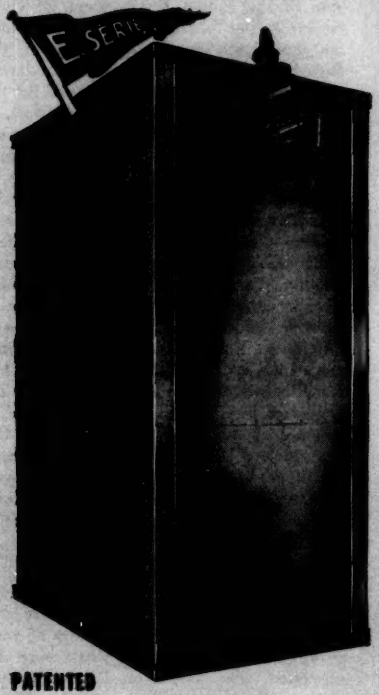
Shown also by the speaker were samples of various sized coaxial cables. He gave an example of the size of an amplifying unit that is used on the coaxial cables for transmitting television programs or



Gordon D. James, Michigan Bell Telephone Co., demonstrates his point in a lecture on transistors given before the Detroit NAPRE group. At right, members give rapt attention to the discussion of "the mighty midget".

*See Question 1168, NAPRE Question Box, May, 1957, Page 43.

The "KING ZEERO" Builds and STORES Cooling



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carrying telephone conversations over long distances. The comparison in the sizes necessary for a transistorized set-up and the former electronic tube set-up was startling . . . Transistorized units are only about the diameter of an ordinary pencil and about two inches long. They are inserted at intervals directly in the coaxial cable. Compared to a unit about 3 x 4 x 3 ft. located at various stations about 35 miles apart, the transistor is indeed a midget's midget. The greater advantage, however, is that signal boosting is now built directly into the cable with the transistor, and they bury the cable and forget about it!

Do-It-Yourself For Long-Distance

A demonstration of a route selecting unit for long distance calls was given. This unit utilizes perforated plates which are automatically set up in sequence so as to select seven different routes to a given long distance terminal, such as from Birmingham, Mich. to Los Angeles, Calif. The units will have the most direct route as the first selection and in the event that the first direct route is busy, this is followed up with six other alternate routes which are automatically selected. Switching is done through these routes automatically until an open route is found. The time elapse in selecting the route is only a matter of a fraction of a second. Also, the switching mechanism, when it is completely transistorized, will cause the telephone which is called to ring almost instantaneously when the last digit is selected.

Refrigeration Controls Transistorized Next?

Various demonstrations were made, which practically confirmed the fact to all attending that in all electronic equipment, wherever electronic tubes are now used, the transistor will be able to replace the vacuum tube. This holds tremendous possibilities for control circuits and alarm circuits on refrigeration systems. Practical engineers are alerted to the fact that this is something to look forward to in the immediate future.

One of James' most interesting exhibits was a tiny portable radio, hardly the size of a pocket tobacco tin, its feature being a minute transistor (about the size of a pea), and powered by a battery no larger than a cigar lighter but having a life of 240 hours. An examination of its innards showed, of course, a conspicuous absence of conventional vacuum tubes. Notwithstanding the fact that the battery had been in the set since last November, when the radio was turned on for a reception demonstration the tone was completely audible throughout the hall, with good clear volume.

Speaker James also gave a demonstration of transistorized pocket size transmitters and receivers, enabling communication without wires between persons in various parts of a building. (Dick Tracy's wrist watch radio is far from being fiction!) In covering the item of invisible transistorized hearing aids for the deaf or hard-of-hearing (hidden in earrings or the frames of eye-glasses), James remarked that the day is not far off when you may encounter a friend who is hard-of-hearing and, in greeting you, he will say "Wait a moment until I put my eye-glasses on so I can hear you".

Reprints Distributed

The speaker not only came with props for his demonstration, but he also distributed reprints of articles on "the mighty midget". The reprints were dated 1953 and 1954! A limited number of manuscripts of Gordon James discussion were also made available. The Bright Chapter, NAPRE, is much obliged to its members employed by Michigan Bell and their Public Relations staff for one of the most interesting, informative and educational sessions in a number of years.—L. L. ADAMS.

Rhodesian Member Builds Fish Storages And Ice Plants

MUFULIRA, NO. RHODESIA — Refrigeration is as important to the development of this nation of Northern Rhodesia as it was to the growth of the food industries in the USA during the past half century. NAPRE member R. S. Rack, when asked about his refrigeration work and interests in Mufulira, wrote back as follows:

"As you are so far away you may be interested in some notes on this country. I cannot offer any American comparisons but the area of the Federation of the Rhodesias with Nyassaland is similar to the whole of Europe without Scandinavia. Apart from the Capital cities and the industrialized Copper-belt much of the country is wild, particularly in the North. As you will know, there is plenty of wild life including big game on land and hippo and crocodiles in the rivers and lakes. These, which are part of the lake systems of Central Africa and the Zambesi, are very large and contain large quantities of fresh water fish.

"Until recently these lakes were not exploited commercially since there were no roads. They are now linked to the towns of the Copper-belt and it is my job to help change primitive peasant fisheries to more modern industrialized organizations. I am Commercial Fisheries Adviser to the Govt. Depts. and Municipalities on commercialization. This includes the mechanization of fishing boats from dug out canoes, the installation of pioneer ice plants in remote areas, the provision of cold storage on urban markets and improvements in fish transport. You will understand that our climate is sub-tropical, (rather like that of California, I understand).

"The fisheries are being developed by both Africans and Europeans with a large measure of protection an encouragement for the indigenes who cannot in all cases speak any language other than an African one. Government assists through education and the establishment of public utility undertakings. Fishermen's cooperative societies are organized to facilitate loans for the purchase of improved equipment.

Portable Ice Plants

"For pioneer ice plants we use portable "Freon" units, air cooled, with a capacity of two tons per day each. These are, in theory, capable of being moved easily as they are mounted within a substantial frame. In practice, this is not so, since the dislocation caused by moving them over the rough going means a complete overhaul at each new site. It would have been preferable to have installed more conventional units to be dismantled when moved.

"On the markets we are putting in plants of anything up to 10 tons a day ice making capacity with cold storage for 10 tons of ice and 10 tons fish. These will seem very small to you but you will remember that the demand for fish is very high and that it is coming down continually to be sold almost immediately. (I would not wish to encourage the use of cold storage for speculation). Cold storage on the markets is supplemented by private trades who own small walk-in coolers.

"Fish transport is something of a problem owing to the poor roads. We have tried various self-contained cooling units but none stand up to the unfair road conditions. Accordingly, we make use of ice which is heavy and bulky.

"From all the foregoing you will see that refrigeration is one of the many aspects of my job which is classified in the United States as a Fisheries Engineer. I am more interested in the economics of the industry with details on costing than in the maintenance of the mechanical side for which I draw on the Mechanical Division of the Public Works Dept. of Govt. At an earlier phase of my career I took my qualifications as a Member of the British Institute of Chemical Engineers and handled practical refrigeration in the Fisheries of Grimsby, England. Now, I leave much of that to the Departments concerned and assume executive, administrative and advisory duties only.

"In your letter you ask if I would make a contribution to our publication. I shall be very pleased to do this and will collect some black and white prints to that end. At the moment I concentrate on color transparencies. The story would be one of isolated plants in rather unusual surroundings. I am rather busy at the moment so that it may take a little time but I will write you further. I am leaving for Germany later in the year to attend a meeting of the Food and Agriculture Organization of the United Nations and will try to get it in hand before I go. If you think it of sufficient interest I shall be pleased; if not, I shall quite understand.

Has Chapter Aspirations

"I think that there should be an opportunity to establish a Chapter here and if you will let me have particulars of your requirements I will see what may be suggested. The Northern Rhodesian Society of Engineers are seeking legislation

at the moment in order to provide designation and eventual registration and protection. I am in touch with the movement and will know what progress is made so far as refrigeration is concerned.

"In your letter you ask if there is any way in which you can assist us here. I think our greatest need is to be kept in touch with the most recent developments and to have detailed knowledge on subjects which are outmoded with you. When we are called on to advise as to the best form of installation, as for example refrigerated transport, we do like to know just what is being done elsewhere. When we are called on to rig up a small walk-in cooler somewhere in the bush we are grateful for basic know-how of construction to save us going the long way round — and so on. The latter is important to us — we have no store around the corner in those circumstances and may have to 'make do'.

"It is much more pleasant to conduct a personal correspondence than to limit associations to impersonal data. Thank you for writing." Thus writes another member abroad.—R. T. BURNS.

a demonstration of field testing water samples, and prescribing treatment or changes of treatment. His talk was enthusiastically received and both he and his company were applauded.

This Bakersfield Chapter is now meeting in the Bakersfield Ice and Cold Storage office building at 2409 Union Avenue. During the month membership applications were received from Joseph Ferritti and W. D. McDaniels, both accepted.

One of our newest members, W. D. McDaniels, informed us that he is moving to the San Francisco-Bay area to take over a job as boiler inspector.—LEON STANFIELD. **(Continued on page 48)**

Mollier Chart and Water Problems at Kern Chapter

BAKERSFIELD—Use of the Mollier Chart was presented by W. R. Greenstreet, ice plant manager for Santa Fe Railroad, Bakersfield, at the April 23 meeting of this new Kern County California Chapter. Greenstreet explained the make-up of the chart, describing what each line or curve was for. He then took a typical day's log sheet from his plant and by selecting figures from those recorded, worked out the volumetric efficiency of his machines. Conclusions drawn by the members were that Greenstreet has a very efficient plant.

The earlier April meeting had Otis Pruett, field engineer for Garratt-Calahan, as speaker of the evening. Pruett's talk was on the problems encountered in recirculated cooling tower water. He explained what causes the different types of scale and corrosion and then detailed some of the methods of treating each. He gave

Members of Bakersfield Chapter and Los Angeles guests pose for amateur photographer W. H. Britten following a recent meeting. Standing, left to right, are C. M. Thompson, Jr., Gilbert Subia, L. W. Thompson, Bernard Hubbard, V. A. Stubblefield, President, California Chapter No. 2 at Los Angeles, Regis Gubser, past national president, Jack Armstrong, Clyde E. Gross, V. E. Wilson. Seated, left to right, Palmer Smith, Edward Oppett, Leon Stanfield, W. R. Greenstreet, R. F. Gilkerson, C. A. Cramer, C. D. Bryson.

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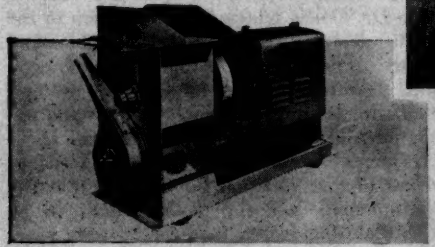

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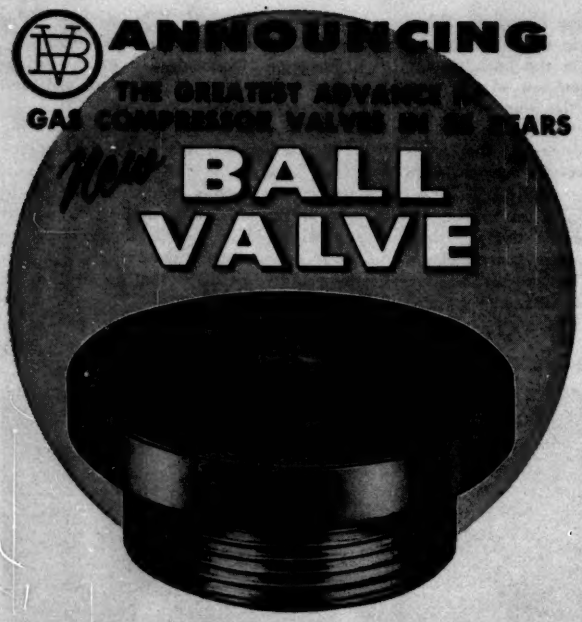

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Army to Study Effect of Food Radiation

A RESEARCH study on processing and preserving food through radiation will be inaugurated at Sharpe General Depot of the U.S. Army at Lathrop, Calif. The first step was taken recently when the Army let a contract for construction of a traveling wave electron accelerator to Varian Associates of Palo Alto. The accelerator will be the first of three major projects at Sharpe's Ionizing Radiation Center, which plans to find out the cost of preserving food by radiation.

Another phase of the project, also initial development work, is already underway at Kaiser Engineers of Oakland. Completing the project will be the construction of a nuclear reactor by the Atomic Energy Commission and an actual food processing plant. The entire plant will represent an $8,000,000 investment.

The entire food industry will have a big stake in the experiments. For example, tests already have shown that gamma rays, beta rays and electrons, usually regarded as products of atomic destruction, have had far reaching effects on food preservation.

In 1952, the Defense Department began studies of the military potentialities of the ionizing radiation process. As a result, the department decided to develop the process to the point where private industry can take over. The Army was given the assignment and Sharpe General Depot was picked as the site.

In the sterilization and pasteurization of food, nuclear ionization is used to destroy bacteria and micro-organisms instead of intense heat. The exposure time is short and only a slight rise in temperature occurs in the product. Also, the radiation process takes place while the food is raw, thus only slightly affecting its flavor, color and odor.

These foods can then be stored in an unrefrigerated room for longer than three months without spoiling. The process has a better effect on some foods than others. Such perishables as asparagus, bacon, green beans, carrots, chicken and pork were rated "good" for long term storing after being processed by radiation. In the "fair" class were beef, bread, corn, ham, green peas, and spinach. Rated as "poor" were bananas, cheese, lettuce, milk, oranges and strawberries. But even the "poor" perishable stayed fresh and edible for weeks after being stored in light plastic containers.

The processing is expected to begin at Lathrop late next year. Private industry and a group of colleges and universities will co-operate in the pilot program, which will have an eventual turnover of 1,000 tons of perishable food a month. The depot is already swamped with inquiries from food processors, refrigeration equipment manufacturers and container fabricators for information on the process.

No Vitamin K Depletion in Frozen Foods

THE promptness with which the National Association of Frozen Food Packers counteracted the publicity emanating from Dr. Dole in Virginia is most commendable. We refer to Dr. Dole's release of information to the effect that freezing depletes Vitamin K in vegetables and the result is related to deaths from coronary thrombosis.

H. P. Schmitt, Research Director for NAFFP, promptly communicated with leading nutrition scientists and obtained their opinions, based on scientific evidence. There is substantial evidence, according to Dr. C. G. King, Executive Director of the Nutrition Foundation, that Dr. Dole's theory is untenable and ridiculous. Vitamin K he said, is relatively stable in frozen foods and frozen vegetables are among its best sources.—TRRF Bulletin

King was among those whose views Mr. Schmitt obtained. NAFFP has reported the canvass of views in a recent issue of its News Letter.

When allegations of this kind occur, as they too frequently do, the effective and appropriate counteractive method is simply to gather authoritative scientific fact and opinion and broadcast it in direct reply. The public is entitled to the scientific truth.

Another case is the present publicity on relationships of fats to heart disease. Every one has heard and read about new discoveries that implicate certain types of fats in vascular and heart ailment. Cholesterol is fast becoming a household word. Dr. King and other nutrition scientists are ably applying common sense and scientific fact to this public scare, in speeches and in information to the press—TRRF Bulletin

Summary of Regional Cold Storage Holdings

THE tenth in a series of annual summaries of regional cold storage holdings has been issued by the Agricultural Marketing Service of the United States Department of Agriculture. The series began in 1946; there was no summary for 1951. In this publication, end-of-month stocks of various commodities are listed according to their geographic distribution during the 1956 calendar year. The purpose of this summary is to provide a ready reference for those interested in the national holdings of foodstuffs reported each month in the cold storage reports. Data for these monthly reports are collected from public, private, and semi-private warehouses, which include specialized ware house facilities such as fruit houses and meat-packing plants. Commodities in space owned or leased and operated by the armed services are not reported. While the supply lasts, additional copies of this publication may be had upon request to the Agricultural Marketing Service, U. S. Department of Agriculture, Washington 25 D. C.

Salt Water Refrigeration Proposed for Fresh Fish

THE USE of refrigerated sea water may eventually solve one of the pressing problems of the fish canning industry. This developing process in the Pacific Northwest deep sea fisheries was to be up for considerable discussion as the Pacific Fisheries Technologists met at the Hotel Chinook in Yakima.

Discussing the use of sea water as a refrigerant one official of the association explained that it is only through more efficient handling salmon and other fish that prices can be kept from rising. He added that at the same time the industry will be increasing its quality for the consumer.

He explained that with the use of sea water the fish will remain in better condition and that they can be preserved much longer than in ice, up to 14 days. One of the savings would be in delivery ships which could remain at sea longer, awaiting full loads, rather than rushing for port as ice thawed. Likewise, canneries could take small loads, add them to the brine and wait for enough fish to operate full shifts, rather than part shifts. This, he said, would cut costs tremendously.

The idea of using sea water is not new. It was developed partially many years ago in Nova Scotia, then dropped. It finally was brought to life at the Vancouver, B. C. Research Station, then spread to Washington and Alaska.

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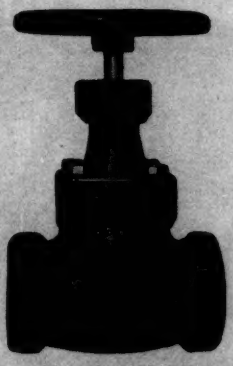
15.0	125
17.6	150
20.1	175
22.8	200
25.4	225
27.9	250
30.5	275
33.0	300



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(Continued from page 45)

Western NAPRE Chapters Participate In First WACIA Conference-Exhibit

LOS ANGELES—NAPRE, through its 14 Western Chapters, and California Chapter No. 2 at Los Angeles in particular, cooperated with the newly formed Western Air Conditioning Industries Association in its first annual Conference and Exhibit held at the Shrine Auditorium, May 4 to 8. Known as the Western Air Conditioning, Heating, Ventilating, and Refrigeration Exhibit & Conference, the exposition displayed products of the Industry available in the 11 Western States, to key purchasing and engineering personnel of retail establishments and industrial plants which find air conditioning and refrigeration a necessary utility to their enterprise. The May 7 meeting, Los Angeles Chapter, NAPRE, was held as part of the technical program of this first annual conference.

Combined with an exhibit of more than 100 booths displaying air conditioning, heating, ventilation and refrigeration equipment produced or marketed in the 11 Western States, four technical sessions were held under the auspices of the sponsoring Association and with the cooperation of NAPRE, Refrigeration Wholesalers Association, Refrigeration Service Engineers Society, Refrigeration and Air Conditioning Contractors of Southern California, Inc., and National Association of Power Engineers. These technical sessions were scheduled so as not to conflict with similar sessions being presented by the American Society of Heating and Air Conditioning Engineers at the Hotel Ambassador during the same week.

Ed. L. Nelson a past chapter President, and Manager of Plants for Union Ice Company, represented NAPRE as a member of the Board of Directors of WACIA. Other groups were invited to the NAPRE session and approximately 200 members of the NAPRE and other refrigeration societies were in attendance. The program was in the form of a diagnostic clinic on refrigeration installations, mainly those used in industrial plants.

NAPRE Clinic Type Program Clicks With Conference

Many Conference registrants received their first experience with NAPRE's famous "no-holds-barred" type of problem clinic. Thrown on a slide projection screen were some two dozen views. They had been prepared to show refrigeration and accessory installations which had given operating trouble and required the services of an engineer to diagnose the trouble and redesign, or reconnect. Members of the audience were given opportunity to analyze the trouble in the light of their own experience. Then the problem clinic went to work.

Panelists appointed to explain problems and answer questions that were projected on the screen were: Regis Gubser, Past National President, NAPRE, and vice-president of California Consumers Corp.; Harold A. Halls, national service manager, Recold Corp., and Kenneth E. Stooksberry, partner in Coast Refrigeration Service.

The slides depicted a multitude of problems in the various categories of refrigeration. As each slide was shown, Moderator Nelson assigned either Gubser, Halls or Stooksberry to direct the discussion on the problem involved. The alert audience, which included engineers in all classifications of the refrigeration industry, caught a majority of the errors of installation, and supplied the answers in most cases. When a correct answer was not forthcoming, the panelist explained the error or misconception, and outlined how the correction was made.

Presented were not only problems in the sphere of the practical plant refrigeration engineer, but also matters concerning air conditioning and service engineers on installations in industrial plants as well as homes, schools and office buildings.

Problems diagnosed covered a wide range of subjects, such as overloaded pumps, misplaced drains, water jackets wrongly piped, ammonia oil drainage using too small piping, flooded coils and what caused it, wrongly connected condensers, etc.

Other Technical Sessions Led By School Conditioning

First technical session of the five day conference was held at 9:30 a.m. on May 4 in the form of a symposium on air conditioning in schools. The analytical symposium, it was announced, was planned as a result of the widespread interest in the problem of proper school air conditioning.

Frank Neal, Western Director, School Division, Minneapolis Honeywell Regulator Co., served as chairman. Participants in the program included the following and their subjects: E. B. Hilton, chief engineer, C. W. Walz Co., analyzed a system using a central boiler and refrigerating plant with multizone units for each building in the school layout. W. L. Donley, consulting engineer, analyzed a unit designed and built with air cooled condensers which used a floor panel distributing system for heating, and wall outlets for cooling each class room.

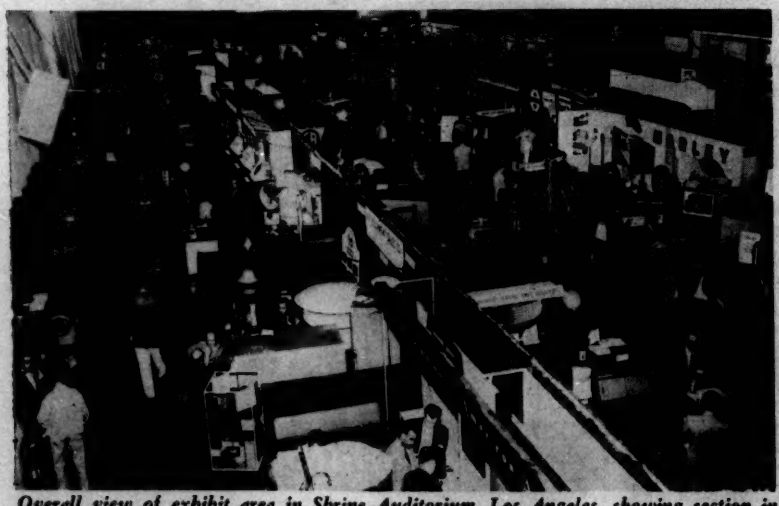
Dale Briggs, Western Manager, Herman Nelson Division, American Air Filter Co., analyzed a system with unit ventilators in each classroom. The subject analyzed by John Leemhuis, Vice-president, Air Floor Co., dealt with the use of a patented floor distributing system for cooling classrooms. Milton Wilson, General Sales Manager, Anemostat Corp., analyzed the application of a high velocity system for air conditioning school rooms and school auditoriums.

A symposium on the air conditioning of different types of structures with various systems made up the three hour technical session which began at 9:00 a.m., May 7. Subjects discussed were "Air Conditioning of Existing Buildings,"[1] by Cary B. Gamble, consulting engineer; "High Velocity System," by C. M. Wilson, Anemostat Corp; "Individual Chilled Water Units", by Albert Hanson, National Refrigeration Co.; "Individual Package Units" by Frank White, Chrysler Air-Temp Corp.; "Weathermaster Systems," by Maurice J. Wilson, Carrier Corp. and "Conventional Air-Duct System," by Clancy W. Pollock, Drayer-Hanson Co.

ASHAE Cooperation

The American Society of Heating & Air Conditioning Engineers sponsored the May 6 and 7 technical sessions, in connection with its Region 4 Conference. Those sessions were held at the Los Angeles Ambassador Hotel.

Subjects discussed at the May 6 technical session were: "Calculations Investigating the Application of Air Conditioning to a School," by Frank M. Neal, Minneapolis-Honeywell Co., and Donald L. Williams of Holladay & Westcoot; "Control of Air Borne Sound Transmission," by J. C. B. Purcell, of Bolt, Baranek &



Overall view of exhibit area in Shrine Auditorium, Los Angeles, showing section in which displays of refrigeration and air conditioning equipment were presented.

[1]See pages 74-77, NAPRE *Operating Data Book*, 1955.

Newman; and "An Investigation of Filter Systems for Removing Irritants from Polluted Air," by Neil Richardson, Engineering Research, UCLA.

Attendance at the technical conference and exhibit was reported to have reached 7,000. The exhibits offered latest in air conditioning and related equipment. It was an opportunity long awaited on the Coast, to learn from technical experts, both in the exhibit hall and in the conference rooms, how new or modernized equipment can increase the efficiency of operations and actually add to potential income. The bulk of the visitors to the exhibits and sessions were refrigeration and air conditioning engineers and designers, architects, contractors, builders, hotel, motel and restaurant executives, government officials, management and purchasing personnel, apartment house, office building and institution management-level personnel.

Arthur J. Hess, of Hess, Greiner & Polland, Los Angeles, president of Western Air Conditioning Industries Association, announced that the unqualified success of this first technical conference and exhibit indicated it would probably be held annually hereafter. R. E. Harkens of the Institute of Air Conditioning and Heating Industries, is vice-president of the association and Fred J. Tabery of the Tabery Corp., secretary-treasurer. Other refrigeration and air conditioning groups are represented on the board of directors by the following men: NAPRE, Ed. L. Nelson, Union Ice Co.; RSES, W. W. Allison; Refrigeration Wholesalers Association, Peter H. Askew of Thermal Products, Inc.; RACCA of So. Calif., Robert H. Savage of Water Chemists, Inc.; NAPE, Robert Warden of Warden & Sons; and, Richard Farr, Farr Co., Geo. Hatch, National Heater Co., D. E. Reznick, Airfan Engineering Co., William P. Tennity, Tennity & Co., and Henry C. Ulovec, Mehring & Hansen Co.—FRED HERR

Air Conditioning, Homo Sapiens and Beef Carcasses at L.A.

LOS ANGELES—Considerable progress has been made in recent years in the adaptation of central or package air conditioning to residences. The industry got its foot in the door, as it were, in this field, through the air coolers and small window units in homes here and there. So remarked, Elmer A. Johnson, refrigeration service engineer with Westinghouse Electric Corp., Los Angeles, who presented a talk on "Trouble Shooting on Package Air Conditioners" at the Los Angeles Chapter, NAPRE, March 6 meeting in the Terminal Club.

Today, in desert and semi-desert regions of Southern California, according to Johnson, the contractors of entire housing projects involving scores of residences now include air conditioning as part of the original plans. Home air conditioning, the speaker declared, is mastering adverse climatic conditions in such areas as Phoenix and Yuma, Arizona, the Imperial, Coachella and Antelope Valley areas of California. In such towns as Barstow, Indio and El Centro, Calif., Johnson pointed out, very few of the homes today are without some sort of air conditioning or cooling system.

Johnson also discussed packaged air conditioners in industry. He said that such units are growing in popularity for use in offices and industrial plants of small size where structural conditions may make it preferable to large duct and coil systems. With a series of slides, Johnson illustrated the mechanical design and operating functions of various types of self-contained air conditioning units which are adaptable to duct work if needed, for supplying several offices with air conditioning. Close-ups of the units, filter, thermostat, compressor and starter relay installation were shown on slides, with Johnson supplying detailed descriptions on how such units should be serviced, maintained and repaired.

Dry Coil Carcass Chilling

New approach to an old problem in the meat packing industry made interesting subject matter for the March 20 meeting of the Chapter. Harold A. Halls, national service manager, Recold Corp., Los Angeles, discussed the problems and characteristics of hot carcass cooling.

In his talk, Mr. Halls quoted liberally and made frequent reference to facts contained in a paper on hot beef carcass cooling, prepared by himself and D. D. Wile, Vice-president and chief engineer of Recold, which was presented by them at the Golden Anniversary meeting of the American Meat Institute in Chicago on

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September 29, 1956. Reprints were distributed, and are reported as being available from Recold or through NAPRE Chapter Secretaries.

Mr. Halls offered the Los Angeles group a synopsized version of a more comprehensive report given at the A.M.I. session in Chicago on a field investigation dealing with the cooling of hot beef carcasses. Conclusions based on the investigation, he declared, indicated that dry coil equipment has a performance ratio equal or superior to the brine spray method, at less operating cost; and that maintenance and deterioration expense involved in the brine spray system are eliminated.

Mr. Halls said that an unusual refrigeration problem confronts the meat processing industry in cooling hot beef carcasses. The beef carcasses, he explained, have had little time to lose their body heat, and just before being put into the cooler have been washed with hot water and covered with cloth shrouds soaked with weak brine.

Therefore it is imperative, Mr. Halls told the members, that the cooling be rapid in order to prevent so called "sour bone", a process which may get going in the round bone and produce deterioration of the rump and other sections. He also stated that it is highly important to guard against formation of slime in the cavity recesses, and that shrinkage must be held to a minimum.—FRED HERR.

Pacific Northwest NAPRE Holds First Area Conference

FIVE CHAPTERS of NAPRE in the Pacific Northwest have teamed up for a regional educational conference starting Saturday June 1. This was the first conference of this nature for the Pacific Northwest Chapters as a group venture. According to Mort E. Bell, an NAPRE National Director and supervising engineer of Sicks Enterprises, who instigated the activity, the educational program was scheduled to commence promptly at 10:30 a.m. on Saturday morning, presenting three papers and a panel discussion. Location for both fore- and afternoon educational sessions was the Fireplace Room of the Tacoma Public Library. Registration preceded the Educational Sessions.

General Chairman for the Regional Conference was Falconer Anderson, chief engineer, Olympia Brewing Company, one of the founders of the Olympia Chapter. Seattle's president, Bob Harrison, mechanical engineer for Boeing Airplane Company, had charge of the educational program. Archie Waterbury, chief engineer, Heidelberg Brewery, and past president of Tacoma Chapter, was chairman of entertainment and host activities. The Winthrop Hotel, Tacoma, was Regional Conference headquarters.

Program Details

Scheduled entertainment for Saturday evening was a dinner program, followed by dancing, at Wehlman's, a private club. At noon, the Heidelberg Brewery hosted both the ladies and gentlemen at a luncheon. There was a boat trip on Puget Sound for the ladies in the afternoon while the gentlemen members were occupied with educational activities. Registration for education and social activities were publicized at $10.00 per couple.

Subjects discussed on the educational program were Vapor Absorption Refrigeration Systems, Booster Compression Systems, and a Description and Analysis of the Air Conditioning System in the new Auditorium at Spokane. Lewis M. P. Brooks, sales engineer for Carrier Corporation, Seattle, discussed the Absorption topic; Ted Orebaugh, W. E. Stone Co., Vilter Mfg. Co. Representatives presented the case for two-stage refrigerating, and Wyman Erickson of Spokane, handled the third presentation. The three panel members handling the general question and answer session are either instructors or past educational chairmen from the five chapters. They are Frank Knowles, Seattle, Archie Waterbury, Tacoma, Howard Peterson, Yakima, Chas. Devine, Olympia, Dick Quam, Spokane, and Phil Gilmore, Portland, who represented the Members-at-Large for the Northwest area.

Colton Studies Satellites

SAN BERNARDINO—California Chapter No. 5, NAPRE, Colton, featured a speaker at the February meeting who presented a picture describing future possibilities of rocket ships and satellites. The speaker was James Heiss electronic engineer at Norton Air Force Base. The film lecture which he used to augment his presentation was by Dr. Van Brown. He discussed the possibilities of building earth satellites that would be positioned a thousand miles or more from terra firma, and described construction and passenger flights by such ship between the satellites and earth.

Three visitors from California Chapter No. 2 at Los Angeles were on hand. However, it was determined that they came over by conventional transportation rather than by rocket ship. Although the vehicle which brought them over carried the name Mercury, it was not the planet thus named. The visitors were past national president and present financial committee chairman, E. T. Quinn, George N. Paulick, national membership chairman and V. A. Stubblefield, president of Calif. Chapter No. 2.

Insulation March Topic

Guest speaker at the March 13 meeting of the Colton Chapter was Lawrence H. Benedict of the Benedict Company of Los Angeles. Larry put on a demonstration and lecture showing the proper application of pipe and pressure vessel insulation. His discussion covered temperatures from minus 400 F to 180 F. The Benedict Company represents NAPRE's Industrial Member MMM, Inc., of Houston, Texas.

In addition to the explanation and demonstration of how to apply insulation material, Benedict also described the Vapo-Wall material fabricated by the MMM firm. The material is Dow Chemical Company's "Styrofoam". A number of adhesives and application materials, from bandings and wrappings of various kinds, were demonstrated and the application of each explained in addition to the importance of vapor sealing. Many industrial applications today require the protection of the insulation from chemical fumes. Benedict also demonstrated the physical stability of his product pointing out the light weight, vapor resistance, compressive strength and other features.—HARRY BONTER.

Heat Calculations at Midsouth Chapter

MEMPHIS—Refrigerated enclosures are much more the concern of the refrigeration engineer than may of them realize was the point made by Tennessee Chapter No. 1, Instructor, H. L. Todd. He put this thought across in connection with Chapter 18, Heat Calculations, at lectures for both April meetings of the chapter.

Although enclosures were emphasized, the principal point, of course, of the discussion was how to go about figuring heat loads. After making the point of good enclosures, Todd showed how to estimate heat gains in two different types of plants. At the first April meeting he described some walk-in refrigerated rooms which would be common to the medium sized institution or hotel.

Using the blackboard to put over his talk, Todd assumed a given size room and figured out how much refrigeration would be needed using the room as a cooler and using 4 inches of cork board insulation on the walls and floor and six inches on the roof. He used the same size room as a freezer, minus 10 F, using 8 inches on the walls and floor and 10 inches on the roof. He figured how much pipe coil or evaporative surface it would require using a 10 degree temperature differential between surface and the refrigerant.

The illustration used at the April meeting by Todd was that of a small dairy plant. He instructed the members on heat calculations to be taken into consideration when building a refrigeration plant for milk coolers and for milk storage, ice cream manufacturing and storage, and for making ice for dairy requirements. He used the blackboard to get the heat load calculations. He sized the refrigeration compressors for 16 hours operation allowing for the normally sharp increase of refrigeration during the peak production hours. He explained each step of the calculations as he went along.

John Harold Robinson, chief engineer West Tennessee T.B. hospital, and Tennessee Chapter No. 1, President, has tendered his resignation as president. He has been given the position of chief engineer with The Humko Company of their $10,000,000 Champaign, Illinois, plant. He assumed his new duty May 15. The Humko Company are the largest processors of cooking oils, salad oils, lard and oleomargarine.

President Robinson's resignation was accepted with regrets as he has made the Chapter a very fine president. He has worked hard while in office trying to keep the interest of the membership up to the highest. He was presented a gold lapel emblem of the Association, for his outstanding work.—CHAS. CONLEY.

Chilling and Freezing of Deep Sea Fish

SEATTLE—Methods of handling and refrigerating salmon from the fishing banks to the canneries in Alaska and the Pacific Northwest are going through another revolutionary change. These changes are resulting in lower and more economical boat operating costs due to: (1) The speed of unloading the fish; (2) Eliminating the tie-up time for the loading and unloading of ice; (3) The cost of ice; (4) A larger pay load; (5) Reduction of bacteria in the fish and in the holds of the boats; and finally, a fresher, firmer and unbruised fish at its destination.

These facts were presented to members of Washington Chapter No. 1, Seattle, on February 21 at a meeting held in the downtown YMCA. Guest speaker was R. McJannet, Refrigeration Engineer, Belt Ice Corporation. McJannet reviewed a paper which he had previously presented to the Pacific Northwest Section of the Society of Naval Architects and Marine Engineers at Seattle, Wash. His paper dealt principally with refrigeration of fish by the use of sea brine. There were many questions provoked by the speaker's presentation of the subject matter.

At the January meeting of Seattle Chapter, M. E. Bell, Supervisory Engineer of Sicks Enterprises, and a national director of NAPRE, was the guest speaker. Bell presented some charts which he had developed from NAPRE educational material over the years, which applied to the various plants under his supervision. The charts had to do with the capacity of compressors, velocity of gases, volumetric efficiency and suction line sizing. Bill Matthews of E. J. Bartell & Co., was also a guest speaker and presented data to the members on the correct application of insulation, both for enclosures, and piping and pressure vessels.—JOHN GRAINGER.

Southeastern Pennsylvania Petitions for Charter

LANCASTER—Members-at-large in Southeastern Pennsylvania met on March 29 to form a new NAPRE chapter. S. Milton Rambo was elected president protem and Odell Drake become secretary protem. Membership chairman appointed was Glenn Maneval.

The new chapter held its second meeting on April 8 and met again for the third time on April 24. A number of new members were signed up at each meeting and attendance increased with the start of the refrigeration instruction program at the late April meeting. Meetings are held in the Consumers Ice and Cold Storage plant, Plum and Liberty Streets in Lancaster. Members came from as far away as Lebanon, Columbia, York and Barto to attend the meetings.

Consensus of the members on the organization committee was that a charter will be installed in the Southeastern Pennsylvania Chapter before the annual meeting of NAPRE, and the chapter will be recognized as having full privileges of other groups in the NAPRE at that time. —ODELL DRAKE.

Tacoma Entertains Neighboring Chapters

PUGET SOUND—Three Pacific Northwest Chapters met at a joint affair in March. Site of the meeting was Heidelberg Brewery in Tacoma with Washington Chapter No. 2 as host. This was the meeting scheduled earlier but cancelled when an unseasonal and rather heavy snow storm hit this area in December. The educational portion of the program consisted of a tour through the Heidelberg Brewery. Wives and guests of the Chapter had been invited. It was well attended. The brewery, one of the finest and most up-to-date in the United States, showed the results of a well trained brewery engineering staff. The engine room was especially noticeable in that it had been recently painted and the various pipe lines color coded. Archie Waterbury, past president of Tacoma Chapter, is chief.

Insulation Discussion

The March meeting of Tacoma Chapter dealt with insulation problems. Bob Ross of the Armstrong Cork Co., with the aid of pictures, leaflets, and actual samples discussed the various kinds and types of insulations. He brought out the advantages and disadvantages of each kind and compared the claims for each, even where different manufacturers were involved.—JIM BENNETT.

Valves and Compressors Greater Kansas Topics

KANSAS CITY—Important as they are to reciprocating compressors it has been noted that not many Chapters spend a great deal of time in discussing valve gear. Greater Kansas City Chapter and its educational committee took their cue from a report in the "Locomotive", a publication by the Hartford Steam Boiler, Inspection and Insurance Company, which report indicated that valves were the cause of most compressor failures.

A program on valves was presented in March. Speaker W. L. Hutton, Midwest Refrigeration, Inc., traced the development of valves from the time when the diameter of the valves were the same at the diameter of the cylinder, to the present, much smaller valves which have been developed for modern high speed machines. Hutton pointed out that it was the aim of every designer to build the most efficient valve possible and one that would maintain that efficiency through long years of service. To conclude his talk, Hutton described the new Ball-type valve that has been developed by Van J. Sparks of Kansas City. Several different sizes of the valve were passed around for examination and thoroughly discussed.

At the conclusion of Hutton's talk his son, Bob, took over and presented some slides showing the various types of Carrier compressors that have been built for ammonia service. He also had slides of actual installations that are in service and gave a very complete description of each.

D. D. Clark, Jr., had brought along three types of valves that at one time or another had been used in one of the compressors still in service at the U.S. Cold Storage Company's plant. Dave described the function of each valve and explained why each was replaced by a later type as they were developed. Several other valve types were demonstrated by V. W. Crocker of Federal Cold Storage Company, and other members. Discussion on valves was so lively that no time was left for further study of the material in the manual. However, at the April meeting most of the time available was devoted to the study of the refrigeration course and considerable time was spent discussing the volumetric efficiencies of our refrigeration compressors. Various items that effect their efficiency were discussed in detail as well as some of the things the operators could do to improve the volumetric efficiencies.

Roy C. Gallup was introduced as a new member of the Chapter. It was noted that Mr. Gallup's father was for many years chief engineer at Railways Ice & Service Company, Argentine Plant, and was at one time president of the Kansas City Chapter. Uel Petty was also introduced. Petty, who has been a member for some time, is an erection engineer for York Corporation and his various jobs keep him out of town practically the entire time.—JOHN MULLER.

Dairy and Air Conditioning Spring Topics in South

NEW ORLEANS—Activities of Louisiana Chapter No. 2 during the Spring program have been somewhat varied. The late February meeting was held at Watkins' Broadview Restaurant where Accurate Industries was host for the evening. Associate member Norman Levenson of Accurate Industries discussed water problems with air conditioning systems. In particular his problem dealt with algae, a problem common to most systems in this area in Spring.

The late March meeting consisted of a field trip to the Gold Seal Creamery Company plant. John Funel, educational director, arranged the trip with A. C. Centanni, chief engineer and general manager of the Creamery. The Creamery had recently undergone some alterations and additions. As a result members were treated to an inspection tour of the latest type of milk chilling processing and storage methods. The tour was leisurely and the members of the Creamery plant and the educational committee were stationed at various items of equipment.

With the air conditioning season in the South upon them, the members of Louisiana Chapter devoted their late April meeting to another special air conditioning program. This meeting was held at L'Enfants Restaurant on April 24. Associate member Andy Feigler of Enoch Sales Company introduced the speaker Frank F. Kennedy of Freitas Co. of Dallas, Texas. Kennedy showed films and discussed the Tecumseh Condensing Unit, its latest advance in design and performance of this type of package refrigerating equipment for air conditioning applications.—JAMES CHAISSON.

Virgil Young Promoted

Virgil Young

DALLAS—For a number of years this North Texas chapter, like many of the chapters to the south of us, has been seriously hampered by the effects of the drought. Then recently Dallas began to get some rain which brightened the outlook considerably. However, someone forgot to turn off the tap and changed our good luck into flood conditions. However, out of all that has come some good news. One of Dallas' own energetic members and a representative of the Dallas Chapter at NAPRE's Convention last Fall, has been promoted.

Virgil Young has been appointed to the post of chief engineer at Alford's Warehouse, President Fred F. Alford announced. He will also continue as superintendent of maintenance. Young, who served as foreman of steel construction when Alford's built the world's largest refrigerated warehouse at 318 Cadiz Street, Dallas, Texas, in 1947-48, has a similar job on his hands now. Alford's is adding 3,750,000 cubic feet to its air-conditioned general merchandise storage building. When the addition — and another addition of the same size — are completed, Alford's cold storage and dry storage combined will total 22,500,000 cubic feet. Young is treasurer of the Dallas Chapter. —W. A. Higgs.

Denver Member of NAPRE Obtains Automotive Patent

DENVER—During the hot months of the year vapor lock is more a topic of conversation among America's drivers than the weather. The cause of vapor lock is simple; gas in the fuel line or fuel pump reaches a boiling point and vaporizes, forming a block to the flow of liquid gas to the carburetor. Until the gasoline cools down to its condensation point again, the driver is helpless.

Every driver who has suffered from vapor lock has his own "home remedy" ranging from waiting it out to pouring water over the line and pump, or wrapping a wet cloth around them. The remedies will eventually work, but if the car is stalled on a lonely road, high in the mountains, or in the middle of downtown traffic the waiting for the lock to break can be nerve-wracking, and the cure may last only a short time since the temperature is lowered only slightly.

All cars are subject to this common failure, but some individual cars, for unknown reasons, are more susceptible than others. Frank DiDonato, a member of Denver Chapter, NAPRE, who is employed as assistant engineer at Safeway Stores Warehouse in Denver, recognized the problem could be solved by fast cooling. He realized also that the solution would have to be simple and inexpensive.

Vap-O-Rid, the trade name for Frank's remedy, consists of an aerosol type can containing an actual refrigerant which is non-inflammable and non-toxic; it can be carried in the glove compartment of the car. When a vapor lock occurs Vap-O-Rid is sprayed directly on the fuel pump for a few seconds, producing instant below zero temperature that immediately liquifies the gasoline. Although Vap-O-Rid is designed primarily for use in breaking vapor locks, it has many other uses. In garages and industry it can be used to shrink metal shafts to remove pressed gears, pulleys, bushings, pins, or for any other cooling or shrinking purposes. It can be used in plumbing to freeze water lines to facilitate repair. In electrical shops to clean and blow out motors as a non-conducting solvent.—Marcus Florida.

Barton Dies in Accident

SACRAMENTO—Long time secretary of California Chapter No. 3, NAPRE, Sacramento, Douglas W. Barton, was killed in an accident in his plant in March. He fell to his death from the top of a freezer cabinet which was being installed. Barton, who is only 51 years old, had been secretary of the Sacramento Chapter for a period of ten years. Chief Engineer for the National Ice and Cold Storage Company at Sacramento, this member was reported to have struck his head on the concrete floor and was pronounced dead on arrival at Emergency Hospital. He is survived by his wife, Mary, and three sons, all of North Sacramento.

Visits Neighboring Chapter

Sacramento Chapter was guest of William Libbey, plant engineer for Diamond Walnut Growers Inc., Stockton, Calif., on April 25. Members of California Chapter No. 1 at San Francisco and the Stockton-Modesto Chapter joined in an enjoyable educational evening at the Walnut Growers plant. Warren B. Ludwig, York Corporation, San Francisco, repeated his excellent descriptive lecture on the 500-ton NH_3 absorption system which he designed and installed for the "Diamond" firm. Ludwig used a blackboard to make sketches of pertinent parts of the system. Following the lecture, members went on a tour of the plant starting with the high pressure boiler which is fired by walnut shells. This boiler supplies energy for the absorption ammonia cycle and motive power for pumps and air supply fans, all of which were viewed firsthand by the tourists. (The Walnut Growers plant visited and the lecturer are the same parties involved in the feature article of the February 1957 issue of Industrial Refrigeration.)

Refrigeration classes continued under the leadership of the chapter instructor, Professor Angus Woodruff, Sacramento Junior College. The March meeting dealt with Chapter 14, Basic Refrigeration, on Operating. Professor Woodruff also prepared and delivered a lecture on temperature-pressure relations of the refrigerant within evaporators and condensers.—J. J. Mullin.

NAPRE Chapter In Metropolitan New York

MANHATTAN—Although NAPRE has had a sufficient number of members in many of the Burroughs of New York City, and in New Jersey as well, it has been a number of years since any chapter functioned in that area. On April 5, some two dozen New York and New Jersey members met with NAPRE National Secretary and re-established a Metropolitan New York Chapter. The meeting was held at the Hotel New Yorker in midtown Manhattan.

Quaid Minich, chief engineer, Seaboard Terminal Refrigerated Warehouse Company, Jersey City, New Jersey, was appointed chairman protem and conducted the meeting. A second meeting was voted by those present and was subsequently held on April 24. The third meeting was held on May 15.

At present, the membership actively participating in the organization of the chapter seems to be divided equally between New Jersey and New York citizens. This holds promise of developing into two chapters in the not too distant future. Arrangements are being made to start the NAPRE refrigeration course with the first September sessions. The chapter will conduct its refrigeration classes at one of the high schools in midtown Manhattan. Member Martin J. Schermer is the committee chairman responsible for educational arrangements. For the summer months the chapter is meeting in a private dining room of the Exchange Tavern on Cortland Street, across from the Hudson Terminal.

Organization committee, in addition to Minich and Schermer, consists of Gustav L. Beinert of Ossinning, N.Y., who is engineer for the Mt. Sinai Hospital, and Karl Schartel of the J. H. H. Voss Co., both of whom had formerly been members of the old New York Chapter. G. Lawrence Allan, chief of the Hampshire House, a Kirkeby Hotel. Robert L. McCreery of Ideal Electric & Manufacturing Company and Thomas J. Alexander, John E. Shanahan and Richard D. Cornell, all of Tropicana Fruit Industries, Inc., are other New York members of the committee. New Jersey members include Joseph Reilly, David Nelson, Hubert Hooper, all of Merchants Refrigerating Co., Claude Brewer and Frank P. Joyce of Monmouth Cold Storage, and Charles Osinski, Alphonse Bracuti and Peter J. Oraneo of Seaboard Terminal.—J.R.K.

Hospital to Sell Ice Plant

THE board of control of the Arizona State Hospital is exploring the possibility of transferring the institution's ice plant to another state agency or selling it on the open market. The board decided to consider the disposal after being informed that a planned remodeling of the power plant could be done about $4,000 cheaper by not including the ice plant.

Milwaukee Kills Ordinance To Limit Water for Air Conditioning

THE Common Council's Utilities Committee of Milwaukee, Wis. by a vote of three to two recommended that an ordinance proposing a "demand charge" for certain air conditioning systems be placed on file. The action was tantamount to recommend killing the proposal. Action came after protests by business men and representatives of the air conditioning industry. The ordinance will go to the Council for final action.

The idea behind the proposed ordinance was to discourage the use and installation of air conditioning systems which do not conserve water by recirculating it. The ordinance would impose a charge of $20 a ton of rated capacity each year for air conditioning systems which do not contain water conservation devices. It also would prohibit systems in which the rate of use exceeds 1.75 gallons a minute.

New Box Keeps Foods Cool

A CHICAGO box manufacturer it is reported, has come out with a new aluminum foil-laminated corrugated container which he claims offers effective no-ice temperature control and reduces costs for refrigerated shipment of cut-up, fresh, tray-pack chickens. Besides its insulation value, the new container has the advantage of chilling contents more rapidly than other boxes, permitting economies in refrigeration, the maker declares. The new box is of one piece construction with a tuck-in lid. It is set up quickly by folding. No staples or other fasteners are needed.

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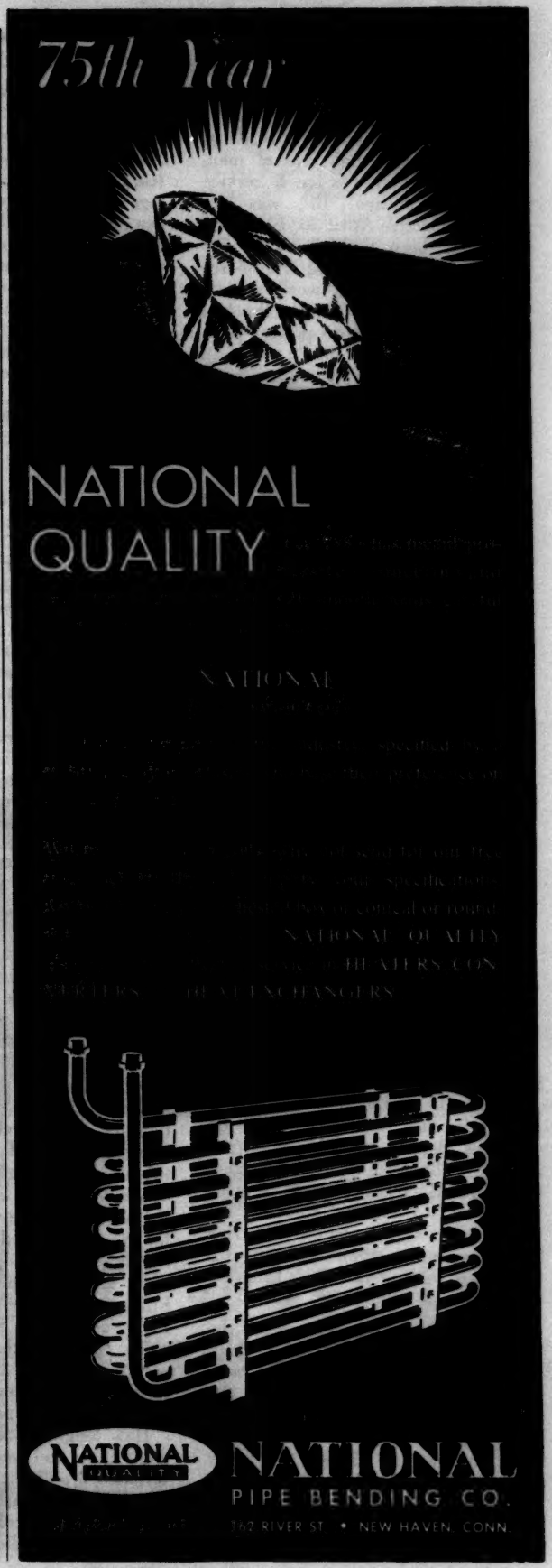

News of PEOPLE

Frank D. King Retires

THE retirement of Frank D. King, vice-president and general manager of The Railways Ice & Service Company, Chicago, Ill., was announced effective April 30, 1957. Mr. King has been with Railways Ice since May, 1909, starting at an early age, after one year's work with a wholesale grocery in Hutchinson, Kansas. He has held his present position as vice-president for 20 years.

Frank D. King

He has been an active member of the National Association of Ice Industries of which he has attended all but two annual conventions since 1929, and of the Illinois Association of Ice Industries, of which he was president in 1944-45. He is also a director of The Executive's Club.

Mr. King says that after 48 years in the ice business, he does not intend to relinquish his interest and connections. But he is going to take it easy, maintaining their apartment in Chicago and, with Mrs. King, spending summers in their country home in Goshen, Indiana.

JOHN H. GLENN, well known among ice men as president of Glenn Services, Beardstown, Ill. was elected Mayor of Beardstown at the election April 16. He received 1608 votes or 54 percent of the total vote cast for mayor. Mr. Glenn pledged to strive for an economy administration, with aldermen sharing the work load, responsibilities and credit.

REED SMITH, formerly with the National Ice & Cold Storage Company, San Francisco, Calif. has been appointed general manager of the Peoria Service Company, Peoria, Ill. L. A. Davis, who has been vice-president and general manager for many years had asked to be relieved of his duties. He will remain with the company in an advisory capacity for a time.

Achenbach Rejoins Bureau of Standards

PAUL R. ACHENBACH has rejoined the staff of the Building Technology Division of the National Bureau of Standards. He will head the newly reorganized Air Conditioning, Heating, and Refrigeration Section. The new section's work will involve the determination of design criteria for and the development of methods of evaluation and standards for air conditioning, air cleaning, heating, humidity-controlling, refrigerating and ventilating processes and systems for buildings and other enclosed spaces.

Mr. Achenbach came to the Bureau in 1937 as a mechanical engineer in the Heat Transfer Section of the Heat and Power Division, which later became the Heating and Air Conditioning Section of the Building Technology Division. He served as Assistant Chief of the latter section for nine years. He conducted and supervised research on all phases of heating and air conditioning. For the past year he has been in charge of the development and design of a human calorimeter at the Naval Medical Research Institute in Bethesda, Maryland, where he participated in physiological research in human metabolism and is co-author of a paper on that subject, recently presented at the International Physiological Congress in Brussels, Belgium.

The Jacobs' To Tour Europe

RETIREMENT has a silver lining —particularly the way it is being approached by Guy W. Jacobs who retired April 1, after six years as NAII Executive Secretary and over forty years in the Ice Industry. To get retirement off to a flying start, Guy and Mrs. Jacobs made plans to go to Europe this summer. Guy's first interest was to attend the Annual Rotary International Convention the third week in May in Lucerne, Switzerland. As glamorous as this event is, it is only a small part of the entire trip.

On May 2, they left Washington for New York and at noon the following day they sailed from New York on the "United States" liner. First they will visit London, then Paris, and on to Switzerland. Their plans following the convention are not complete, but they probably will include visits to Italy, Germany, and other interesting parts of Europe.

How long will they be away? We don't know and we doubt if they do. Without deadlines and office hours, there'll be no reason to hurry. Best wishes to the Jacobs for a fine and well deserved holiday!—Ice News.

DEATHS

Harry A. Phillips

DEVELOPER of numerous refrigerant liquid controls, Harry A. Phillips, died in March 1957. Founder of the H. A. Phillips Co., he had been disabled and inactive with his firm for a number of years until his death March 24. Phillips is survived by his wife, Mrs. Wayland C. Phillips, who has continued to operate H. A. Phillips & Company.

Harry A. Phillips was a past chairman, Chicago Section, ASRE. He was known for the numerous control valves and methods of refrigerant liquid control, which he invented and which were manufactured by his company. He was educated at Kemper Military Academy in Boonville, Mo., and the University of Wisconsin, where he received a B.S. degree in mechanical engineering in 1922. Mr. Phillips interrupted his college training to serve in the aviation section of the Signal Corps in World War I.

From 1923 to 1928 he was erecting engineer and sales engineer for Westerlin & Campbell Co., and the following year sales engineer and manager of the refrigeration department of the Chapman Drug Company in Knoxville. In 1929 he founded his own company. He had been special adviser and consultant on refrigeration controls to numerous manufacturers, and had contributed papers to trade publications on such subjects as "Liquid Controls for Flooded Operation with Freon".

D. Glenn Sorber

THE death of D. Glenn Sorber, well known research worker in the field of fruit and vegetable processing occurred April 9, 1957, following an extended illness. Mr. Sorber was employed in the Western Regional Research Laboratory, U. S. Department of Agriculture, Albany, California, from 1941 until his retirement in October, 1955. Previously he worked in the Department's Fruit and Vegetable Chemistry Laboratory in Los Angeles for 15 years. His major projects in California were concerned with preservation of dried fruits with sulfur dioxide, application of ethylene in the harvest of walnuts and pears, preservation of foods by freezing, and analytical work in conjunction with other work on fruits. In recent years his industrial-liaison work took him to nearly all the frozen-food-processing plants in the western States.

New AWA and NARW Officers Elected At Annual Convention

OFFICERS of the American Warehousemens' Association were elected at the closing general session of the 66th annual convention held at Atlantic City April 1-5, 1957.

Raymond M. King, King Storage Warehouse, Inc., Syracuse, N.Y., was named General President succeeding M. W. Young, National Ice and Cold Storage Co., San Francisco, California. Other officers elected were: General Vice-President, Gilbert J. Stecker, Merchants Ice and Cold Storage Co., Louisville, Ky.; and General Treasurer, W. A. Morse, Security Warehouse Co., Minneapolis.

The National Association of Refrigerated Warehouses elected the following officers:

N A R W Officers

S. A. Kadane, Pure Ice & Cold Storage Co., Dallas, Texas, was named president succeeding Gilbert J. Stecker, Merchants Ice & Cold Storage Co., Inc., Louisville, Kentucky. Mr. Kadane served as NARW vice president last year. Other officers elected were: Vice President, Philip G. Kuehn, Wisconsin Cold Storage Co., Milwaukee, Wisconsin; and Treasurer, John L. Bear, Kansas Cold Storage, Inc., Wichita.

New AWA Officers: Millard Young, San Francisco, retiring president; Raymond M. King, Syracuse, N. Y. president; Willard A. Morse, Minneapolis, Minn. treasurer; Gilbert J. Stecker, Louisville, Ky. vice-president.

New NARW Officers; Gilbert J. Stecker, Louisville, Ky. retiring president; S. A. Kadane, Dallas, Tex. president; Philip G. Kuehn, Milwaukee, Wis. vice-president; John L. Bear, Wichita, Kans. treasurer.

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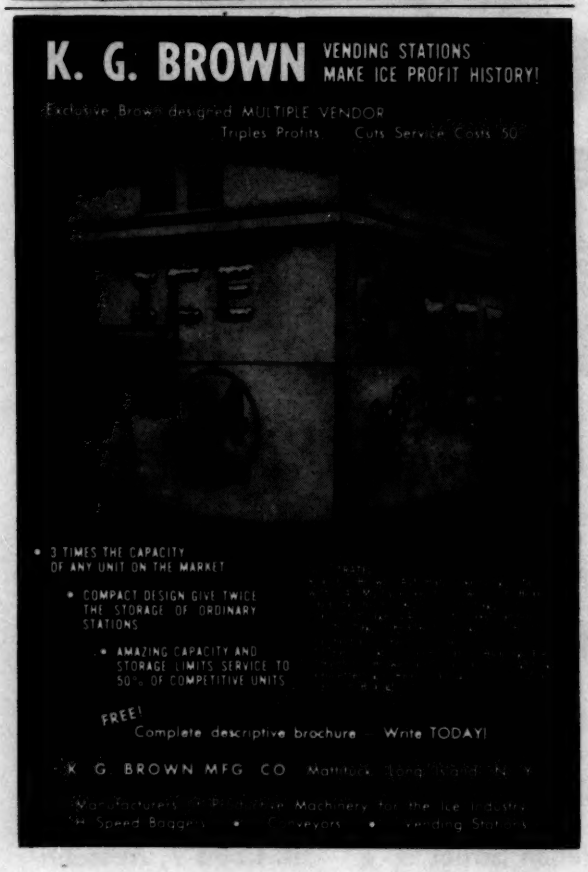
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Frozen Blood Bank Tried On Hospital Level

THE closed-system centrifuge for glycerolizing and deglycerolizing red blood cells in connection with low-temperature storage is advancing from the research to the hospital level. A blood collection unit and storage bank has been set up at the United States Naval Hospital, Chelsea, Mass., to determine the mechanics and logistics of blood collection, red cell separation, glycerolization and long-term storage at minus 80 C under typical hospital blood-bank conditions.

This new method by which the blood is processed and stored under sterile conditions has been proved successful by workers at the Protein Foundation, Jamaica Plain, Mass., where fundamental research on blood preservation and related problems is carried on. Dr. James L. Tullis of Harvard Medical School, who is in charge of blood preservation work at both locations, reports that some 350 units of blood have been collected and stored from two weeks to thirteen months at minus 80 C, with a post-transfusion survival rate for red Blood cells at 85-90 percent. When used in transfusions, there was no difference between freshly processed red blood cells and those stored for as long as thirteen months. There has been no pyrogenic reaction in any recipient.

Turkeys in Storage

INVENTORY figures on classes of turkeys in storage on January 31 have been released by the Institute of American Poultry Industries. The semi-annual report, said Dr. Cliff D. Carpenter, president, was compiled from figures received from 279 warehouses (compared with 319 last year), members of the National Association of Refrigerated Warehouse. The reporting warehouses are located in 191 cities in 41 states. An additional 46 warehouses reported no turkeys in storage (compared with 75 last year). A total of 111,719,135 pounds of turkeys in storage was reported. This does not include any turkeys held in other than public warehouses.

Of the total tonnage reported, 108,441,647 pounds were classified. The unclassified tonnage (3,277,448 lbs.) was held in 14 warehouses (compared with 746,187 pounds unclassified held in 13 warehouses in the 1956 report).

Eviscerated hen turkeys comprised 16.15 percent of the total classified stocks this year compared with 17.44 percent a year ago. Eviscerated tom turkeys totaled 78.80 percent — up from 74.32 percent in 1956. Eviscerated broiler-fryer type turkeys were 3.78 percent — down from 5.15 percent the previous year. New York dressed tom turkeys, 1.00 percent (2.63% in 1956) and New York dressed hen turkeys, .27 percent (0.46% in 1956).

"The value of this report," said Dr. Carpenter, "lies in the percentage figures for the different classes of turkeys, which can be applied to U. S. Department of Agriculture total storage holdings for January 31 to provide a fairly close estimate of the national holdings by classes."

Future of Frozen Meats

WITHIN ten years, most meat handled by food retailers will be frozen. Until the fish industry began packing its product frozen some years ago, it didn't get anywhere. Now 90 percent of fish sold at retail is frozen. (Opinion expressed by H. V. McNamara, President of National Tea Co., at American Meat Institute's Annual Meeting).

In line with an apparent trend toward warehouse delivery of meats, more retailers will be warehousing their meats. Thus checking of weights and other handling can be done at a central place and better utilization of cuttings results.

Apple Scald And The Weather

THE relationship of rainfall between late July to early September in England to extent of scald of apples has been investigated by J. C. Fidler of the Ditton Laboratory in Kent. He concludes that if a producer had a high scald percentage in 1947 and a lower but still high percentage in 1949, 1953, and 1955, it is probable that similar results will be obtained in years with the same sort of weather during the period mentioned. It should, in fact, be possible to predict from measurements of sunshine and rain, whether scald will be absent or slight, moderate or severe.

This conclusion is very interesting and suggests, of course, that all growers concerned with scald might profit from study of weather records. Dr. Fidler does not wish to suggest that other influences are not important—such as type of soil, root stock, genetic factors, and fertilization. He has strong evidence that weather is an influential factor.—TRRF Bulletin.

Big Advertising Push For Frozen Orange Juice

FLORIDA frozen orange concentrate will get an additional quarter million dollar advertising push within the next two months, Florida Citrus Commission reveals. Kick-off for the all-out campaign, the Commission says, will be made with a 700-line advertisement in some 200 newspapers covering all principal markets in the United States and Canada where frozen orange juice is sold.

This is the initial result of the increased advertising tax on oranges recently approved by the Florida legislature which makes it possible to greatly accelerate advertising effort, explains Paul Patterson, commission ad director. He said they are launching this campaign now because this is historically one of the best selling seasons in the year for frozen orange juice.

COMING CONVENTIONS

AMERICAN SOCIETY REFRIGERATING ENGINEERS
June 2-5, 1957
Hotel Fontainebleau, Miami Beach, Fla.
R. C. Cross, Executive-Secretary.

WESTERN PLANT MAINTENANCE & ENGINEERING
June 11-13, 1957
Civic Auditorium, San Francisco, Calif.

SOUTHWESTERN ICE MANUFACTURERS ASSOCIATION
Conference of Engineers
October 23-24, 1957
Gunter Hotel, San Antonio, Texas
P. A. Weatherred, General Counsel

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
November 14-16, 1957
Shoreland Hotel, Chicago
R. C. Cross, Executive Secretary, New York City

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 18-21, 1957
Hotels Del Prado & Sherry, Chicago
J. R. Kelahan, Secretary

AIR CONDITIONING & REFRIGERATION EXPOSITION
November 18-21, 1957
International Amphitheatre, Chicago, Ill.
George Mills, Show Director.

SOUTHWESTERN ICE MANUFACTURERS ASSOCIATION
December 1-3, 1957
Stephen F. Austin Hotel, Austin, Texas
P. A. Weatherred, General Counsel

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OVER A CENTURY OF SERVICE IN CHEMICALS 1855 - 1957
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Ice Association Offers New Facts About Ice Industry

A REVISED edition of "Facts about the Ice Industry" has been published by the National Association of Ice Industries. First issued several years ago, this revised edition provides information on the newer ideas in ice merchandising. It tells why ice is necessary for the preservation of fresh produce and other foods, and tells of the many different ways it serves the public, and how it contributes to better living.

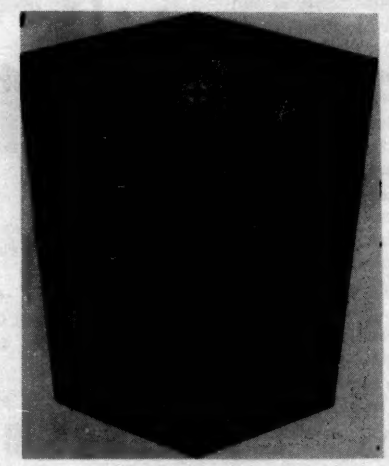
This impressive and up-to-the-minute statement of facts about the ice business should be placed in the hands of all ice employees, stockholders, and business associates. The booklet is ideal also for distribution to the members of civic clubs or to the members of other organizations.

Ice Plant Expands

THE Ice and Cold Storage Company, Klamath Falls, Oregon, has awarded contract to build an addition to the present plant. The addition will contain about 215,600 cubic feet and will cost approximately $100,000.

Safety Award to Ice Plant

A GOLD plaque was presented recently to the Ice Division of the Southland Corporation at Temple, Texas. The seven employees of that plant now represent 63 years of service. They have established a record of 170,000 accident-free man hours and 635,000 accident-free vehicle miles. Good attitude and good driving manners of the employees are responsible for this outstanding record, according to W. F. Leonard Jr. safety director for Southland Corp.



Gold plaque awarded to Temple Division of Southland Corp.

Alford Adds Egg Processing

AN EGG breaking plant on its Dallas property at 318 Cadiz for Standard Brands, Inc. of New York City will be added by Alford Refrigerated Warehouses, Fred F. Alford, president of the firm has announced.

The plant, which is capable of processing one million eggs daily, will provide 10,000 square feet of operating space, 10,000 square feet for general materials storage, 50,000 cubic feet of cooler space, and 50,000 cubic feet of sharp-freeze space. At top seasonal operation, Alford will make available 300,000 or more cubic feet for storage of frozen eggs.

The plant will be modern in every respect and under constant federal inspection, Charles J. Terry, Kansas City production officials of Standard Brands, declared. He pointed out that the new plant will give egg producers in the Dallas area a greater market, giving a larger and more stable market to the farmer.

The contract with Standard Brands was the second signed by the Alford firm with a large food manufacturer in recent weeks. The organization has been named as distribution center for General Foods, providing space, men and machines for an operation that already exceeds a 3,000 carloads-a-year rate.

In addition, the firm is enlarging its facilities to the extent of 3,750,000 cubic feet to take care of expanding storage, distribution and processing operations.

Ohio Spring Clinic

A COMBINATION Spring Clinic and Board of Directors meeting of the Ohio Association of Ice Industries was held on May 16 at the Deshler Hilton Hotel in Columbus. It was an informal round-table type of meeting designed for the purpose of discussing problems in manufacturing, maintenance and distribution, ways and means of cutting operating costs, and a general exchange of information.

New Cold Rooms

THE Seattle Ice & Cold Storage Co. plans construction of cold rooms in the third and fourth floors at 2200 First Ave. S., at an estimated cost of $10,500. Insulated partitions will be installed.

Distilex renders raw water the same as distilled water for ice making, and increases tonnage production by decreasing the number of hours required to freeze untreated water.

Distilex, safe and easy to use, prevents white butts, and eliminates cracking while ice is being frozen, dumped or cut. Economical—Distilex costs less to use than cracked bar losses.

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An effective cleaner for spray ponds and cooling towers, SOLVEX goes to work immediately without costly shutdowns. Cooling efficiency is rapidly restored by using 1½ pounds per 10 gallons of water.

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MANUFACTURERS' NEWS

Ice Cream Distribution Center Installs Modern Refrigeration Equipment

MEETING the summertime demand for ice cream bars in the populous Eastern Long Island area is a job that requires peak, trouble-free performance from cold storage equipment. Thus, the nationwide Good Humor Corp, utilizes Kramer Trenton Co. equipment throughout the refrigeration installation at its Lindenhurst, L. I. distribution center.

The Lindenhurst distribution center is the nerve center of an extensive operation employing more than 100 refrigerated trucks to bring "Good Humors" direct to the consumer. Breakdowns in its refrigeration system could mean the loss of many thousands of dollars worth of stored ice cream bars. Consequently, the Hallam Engineering & Construction Corp. of Brooklyn and Hempstead, N. Y., realizing the importance of a properly functioning minus 20 F system, specified Kramer Thermobank automatic re-evaporative hot gas defrost low temperature cooling units and Kramer Unicon air-cooled condensers for use in the plant.

The distribution center's huge cold storage room is equipped with six Kramer TV-520 Thermobank evaporators on a by-pass "L" bank hookup. The Thermobank employs Kramer automatic re-evaporative hot gas defrost system which provides completely automatic rapid defrosting operations and protects the compressor from liquid refrigerant slugs during defrost.

The Thermobank evaporators are operating with two Frick heavy duty industrial type F-12 single stage compressors, each of which operates three evaporator units. The compressors are provided with refrigerant cooled heads and are electrically interlocked for sequence starting.

The condensing operation is handled by two Kramer BD-3000 Unicon air-cooled condensers which are mounted on the roof of the building. The Unicons, which use no water for condensing, are a decisive factor in defeating corrosion problems in the system. They are equipped with sequenced pressure switches to maintain proper head pressures throughout the year. The controls permit either fully automatic or hand operation, depending upon plant requirements.

In building the cold storage warehouse, ventilating tile ducts are provided in the floor to prevent heaving, and the ceiling insulation is secured by a galvanized channel ceiling for maximum rigidity.

The packaged Good Humor product arrives at the distribution center in heavy refrigerated tractor-trailers and is then transferred to the storage room which is maintained at a temperature of minus 20 F. In the freezer, the shipment is broken down in retail quantities and placed on checkout trucks for tranfer to the route trucks.

Harvard Brewery Liquidated

START of complete liquidation, including real estate of Harvard Brewery of Lowell, Mass., has been announced by Samuel Greenberg, president of the Brewers and Bottlers Equipment Company with home offices at Hartford, Conn. The liquidation of this modern plant with a 600,000 bbl. annual capacity includes real property and equipment not often found at brewery liquidations. Greenberg said that in 1948 to 1954 a great modernization program had been put into effect and that most of the brewhouse, power house and bottling machinery, etc., had been installed new at that time.

It is estimated that the proper dismantling of this plant will take up to one year and will necessitate the use of over 100 freight cars. Frank Boitz of Pueblo, Colorado, and former brew house master and engineer, who has been connected with the brewing industry for over 20 years, is to be in charge of the dismantling and shipping. Mr. Boitz and his crew recently dismantled a large brewery in Jeannette, Pa. and shipped the same to Mexico.

The Brewers and Bottlers Equipment Company specialize in undertaking complete plant liquidations and dismantling. Within the past year they have dismantled such plants as Fort Pitt Brewery in Jeannette, Pa., LaCrosse Breweries Inc., at LaCrosse, Wis., Trommers Brewery in Brooklyn, N. Y., and the Harvard Brewery Plant at Lowell, Mass.

Jordan Joins Sporlan

Harold S. Jordan

HAROLD S. JORDAN has joined the Sporlan Valve Company, St. Louis, Missouri. He will assist P. J. McCarty, head of Sporlan's Los Angeles Sales Office, in covering Southern California and Arizona. Mr. Jordan, a graduate of California Polytechnic Institute, has a B.S. Degree in refrigeration and air conditioning engineering. Prior to joining Sporlan he was a field sales engineer for a large manufacturers representative in the San Francisco area.

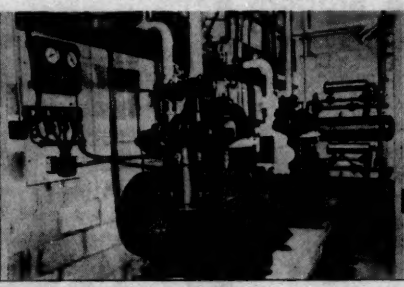
Floreth New Midwest Manager for York

J. WESLEY FLORETH, manager, industrial refrigeration sales, York Corporation, subsidiary of Borg-Warner has been promoted to manager, Midwest District, with headquarters in St. Louis, effective April 1, according to Ray K. Serfass, vice president and general manager of the Industrial Division of York.

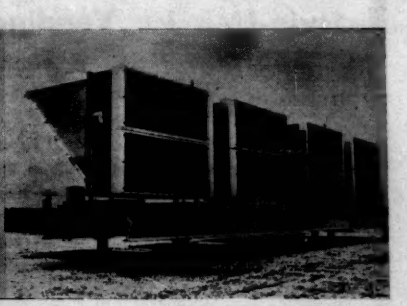
In his new position, Floreth will be responsible for sales, sales engineering and installations of York air conditioning and refrigeration equipment of the type used in large office buildings, hotels, hospitals, low-temperature test facilities, meat packing and food processing plants in Missouri, Kansas, Colorado, Nebraska, Iowa, Oklahoma, Arkansas, Idaho, South Dakota, Utah, Wyoming and parts of Illinois, Kentucky, Mississippi, Montana, Nevada, Arizona, New Mexico and Tennessee.

Floreth was born in St. Louis and has a B.S. degree in Chemical Engineering from the University of Illinois. He joined York's college graduate training course

Five of the six Kramer TV-520 evaporator coils which maintain minus 20 F temperature in Good Humor Lindenhurst, L. I. distribution center low temperature warehouse.



Two Frick 7-¾ x 5 heavy duty industrial type Freon-12 compressors maintain minus 20 F freezing temperature. Above the compressors are two Kramer "L" Thermobanks



Two Kramer Model BD-2000 Unicons, one connected to each compressor, provide sufficient condensing capacity without the use of water.

in 1936 after which he worked in sales engineering and later as a field sales engineer in metropolitan New York. During that time he was a member of the York "Top-ten" sales club for eight successive years. In 1954, he was made manager, Industrial Refrigeration Sales, with headquarters in York, Pa.

Carrier Promotions

TWO executive promotions at Carrier Corporation have been announced by Cloud Wampler, chairman of the board.

George Lilygren, vice president and general manager of the Machinery and Systems Division, has been placed in charge

George Lilygren

Charles V. Fenn

of the newly-formed Corporate Development Division. Mr. Lilygren will be responsible for Carrier's integration and acquisition program.

Charles V. Fenn, vice president and assistant general manager of the Machinery and Systems Division, has been named general manager to succeed Mr. Lilygren.

This division is responsible for Carrier's heavy equipment business including central air conditioning systems for office buildings, department stores, hotels, factories and other large structures. One of its major fields is the production of air and gas compressors used widely by the chemical, petroleum and petro-chemical industries.

New Worthington President

THE election of Walter H. Feldman, Westfield, Conn. as president has been announced by Worthington Corporation, Harrison, N. J. He succeeds Edwin J. Schwanhauser who becomes vice-chairman of the board of directors. Mr. Feldman was first associated with Worthington in 1944 as president and general manager of Electric Machinery Manufacturing Co., which became a part of Worthington in that year. He has been with Electric Machinery since 1922 and has served as general sales manager and vice-president in charge of sales. He became vice-president of Worthington in charge of sales in 1950.

L. E. Cover Joins Fiberglas

L. E. COVER, who retired April 1 from Armstrong Cork Company after more than 41 years of service, has joined Owens-Corning Fiberglas Corporation, Toledo, Ohio, manufacturer of a wide variety of insulating materials, filtration products and textile yarns. Mr. Cover will serve as a consultant to the company's Appliance and Equipment Products Division, according to an announcement by H. G. Ervin, division sales manager. At the time of his retirement, Mr. Cover was manager of the Equipment Insulation Department at Armstrong. Other assignments with this company included research, technical sales and management responsibilities.

CATALOGS AND BULLETINS

New Flow-Mizer Evaporative Condensers

AN 8-page catalog has been issued by Acme Industries, Inc., to announce the new line of Flow-Mizer Evaporative Condensers. Offered in ten different models with a capacity range to 200 tons, these new units are designed to meet a variety of needs in refrigeration.

Polar

Style-Line Ice Vending Stations Shipped Ready-To-Operate

Photo: Station 8' wide x 20' long, equipped with three vendors to sell 10# bags cubes; 25# cakes; and 25# bags crushed.

- Sparkling White Exterior
- Beautiful Streamlined Design
- National Rejectors Coin Mechanisms
- Two Time Clocks
- Protective Canopy
- Automatic Counter
- Florescent Lights

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REFRIGERATION ENGINEERING COMPANY
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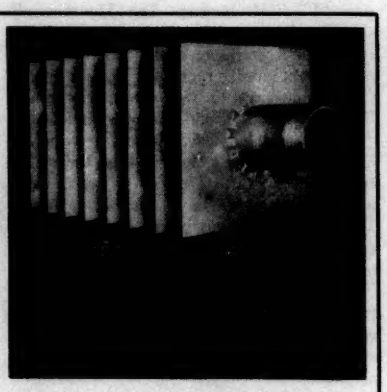
FRICK



Prestfin Pipe

Is ideal for cold storages, freezers, food processing and meat packing plants, etc. Manufactured from 2" dia. F.W. steel pipe and 7" square 14- gauge fins, Frick finned pipe gives maximum heat transfer per dollar invested. Each fin is bonded to the pipe under tons of hydraulic pressure. All assemblies are hot-dip galvanized.

These new Frick finned coils require only one-quarter of the space needed for bare pipe having the same surface. See your nearest Frick Branch or Distributor for complete details, or write for Bulletin 158.

DEPENDABLE REFRIGERATION SINCE 1882
FRICK CO.
WAYNESBORO, PENNA., U. S. A.

Operation of Rotary Booster Compressors

AN eight-page article on the operation and maintenance of rotary booster compressors in refrigeration plants is now available from Freezing Equipment Sales, Inc., York, Pa. The article is written by Richard P. Godfrey, Assistant Plant Manager, J. H. Dulany & Son, Exmore, Va. It is illustrated with three photographs and three drawings, including four sectional views of a rotary compressor showing parts in detail. Functions of essential elements are described in the text, along with detailed steps for periodic inspection, overhaul and reassembly.

Power for Pumping

A NEW 12-page power selection handbook, "Selecting Power for Pumping, has been released by Caterpillar Tractor Co., This booklet is especially designed to be usful to those who have a pumping operation. "'Selecting Power for Pumping" contains a checklist of features necessary for continued dependable operation on pumping jobs. Step-by-step, the checklist describes the proper requirements which an engine must have, backing them with illustrations and examples of efficient installations. "Selecting Power for Pumping" is an excellent aid to anyone who wishes to match the proper engine to his pumping requirements.

New Bulletin Covers Direct Adhesion of Insulation

A NEW bulletin (34-AH) is available from E. H. O'Neill Floors Co., Cicero, Ill., covering the direct adhesion of Foamed Plastic (rigid board type) insulation and the laminations of layers with Fire-Ban Insulation Erection Cements. Direct adhesion to most any approved type of ceiling or wall backing is now claimed practical. The manufacturer claims a saving of one third over the costs of stripping, shoring, nailing, skewering, etc., with attendant loss of time; also that this erection cement sets to rocklike hardness and defies separation even by force. It is fireproof and can be installed in areas substantially below freezing temperatures.

Bulletin on Ice Plates

A BULLETIN describing their new line of cast aluminum ice plates for cooling liquids with ice has been issued by Heat-X-Inc., Brewster, N. Y. These plates are available in six sizes with 1, 2, or 3 circuits. The bulletin lists various capacities in which the plates are available and points up the simplicity of installation and maintenance. "In use" operation is explained and illustrated in some detail. Pointing out that no external refrigeration is required for this self-contained unit, the bulletin explains that these ice plates are an ideal means for chilling beverages.

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PIPE BENDS AND COILS
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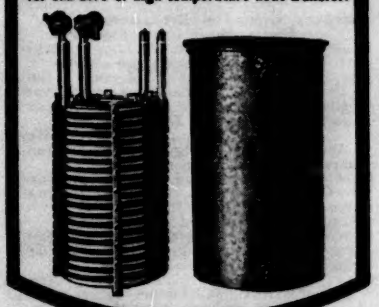
Rempe Shell and Coil Assembly
for sub-zero or high temperature heat transfer.



In Rempe Coils you get Top Engineering and Quality Construction — the best in Refrigeration Equipment for long-life and low maintenance.
For Ammonia or Freon. All materials — Stainless Steel, Copper, Steel.

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USED EQUIPMENT—wanted & for sale

FOR SALE — Refrigeration equipment; ice equipment; new, used. Advise us your needs. Use "QUICKSEAL" — stops brine tank leaks; easy, efficient, economical. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299

FOR SALE—4x4, 5x5, 8x8 Yorks, 5x5 Frick. 20" ammonia receiver, reconditioned. Valves up to 4", 40% off. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE—3000' steel tubing 1½" in coil banks approximately 18' long. Good 5 x 5 Lipmon, 5 x 5 York with broken shaft. Reasonable. Harp's Green Valley Farms, Inc. 309 N. Oklahoma, Shawnee, Okla.

FOR SALE

4—10"x10" 4-cyl. York duplex D.C. to 225 h.p. motor.
2—10"x10" 2-cyl. Frick D.C. to 100 h.p. motor.
2—10"x10" 2-cyl. York D.C. to 100 h.p. motor.
3—9"x9" 2-cyl. York D.C. to 75 h.p. motor.
1—7¾"x5" Frick booster.
2—7½"x7½" 2-cyl. York compressors.
1—6"x6" Frick 2-cyl. compressor.
1—5"x5" York 2-cyl. compressor.
1—3"x3", 1—4"x4", 1—5"x5" condensing units
11"x22"x47" — 11"x22"x51" ice cans.
20—100-ton ice plants, York and Frick.
1—3¾"x3" 8-cyl. V/W York belt driven ammonia compressor.
1—5¼"x4¼" 6-cyl. V/W York ammonia booster compressor.
1—6¾"x5" 6-cyl. V/W York booster ammonia compressor.
1—25-ton Chrysler Air tem. Freon condensing unit, complete.
1—40-ton General Electric Freon condensing unit, complete.
1—50-ton General Electric Freon condensing unit, complete.
1—50 ton Buffalo Freon evaporative condenser.

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Synchronous Motors, NEW engine-type,
440 volt with EM line starters,
125 hp EM 277 r.p.m. 80% PF
150 hp F-M 327 r.p.m. unity PF.
49- new 5 can baskets for 11"x22" cans.
Air agitation equip. for 384 cans.
1-ton Vilter Pakicer new, 1 ton bin, 3 hp condensing unit.
Misc. new and used refrigeration equipment.

RALPH E. MANNS CO.
1030 E. Anaheim St. Wilmington, Calif.

NOTE—You're missing the greatest news in gas compressor valves in 35 years if you fail to read the Ball Valve ad on page 46.

WANTED—300 ice can covers, used; 14¼ x 24¼, good condition. Irvington Ice Co., Irvington, Va.

FOR SALE—One 5x5 Frick unit with 15 h.p. motor and switch, condenser, all automatic controls. Excellent condition, ready to connect. $1250.00 F.O.B. Greenwood, Mississippi. Write Crenshaw Lumber & Ice Co., Crenshaw, Miss.

FOR SALE—1 — Wheeler metal cooling tower, 12'x14'x26' high — 500 G.P.M. 1 — DeLaval centrifugal water pump, 600 G.P.M., 25 h.p. motor, 220 V., 2 phase, 60 cyl. 1 — Frick liquid ammonia control, complete with Solonoid valves and fittings. For brine cooler application. Used only 1 month. Industrial Cold Storage Co., American & Berks Sts., Philadelphia 22, Pa.

FOR SALE

9x9 Frick 360 r.p.m. w/100 h.p. motor.
10x10 York w/V-belt drive.
10x7½ York & 8x6 York Model D-8 boosters.
7½x7½ York w/V-belt drive to 50 h.p. motor.
4x4 York self contained unit.
Two 6'x16" coded receivers w/valves.
3—7'x3'6" freezer doors (new).
2—3¾ ton Shepard 3 motor cranes.
11x22x51/52" ice cans in grids of 15.
Condensers, receivers, motors, etc.

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GArfield 6-2221

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We carry a complete stock of repair parts for all Baker ammonia and "Freon" compressors, condensers, valves and ice plant equipment.

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5014 S. 24th St.
Omaha, Neb.

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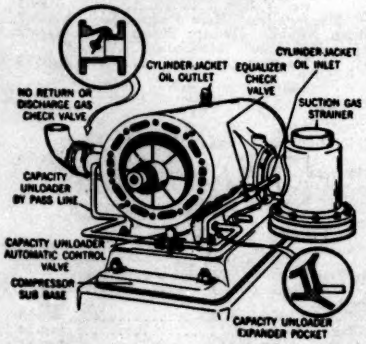
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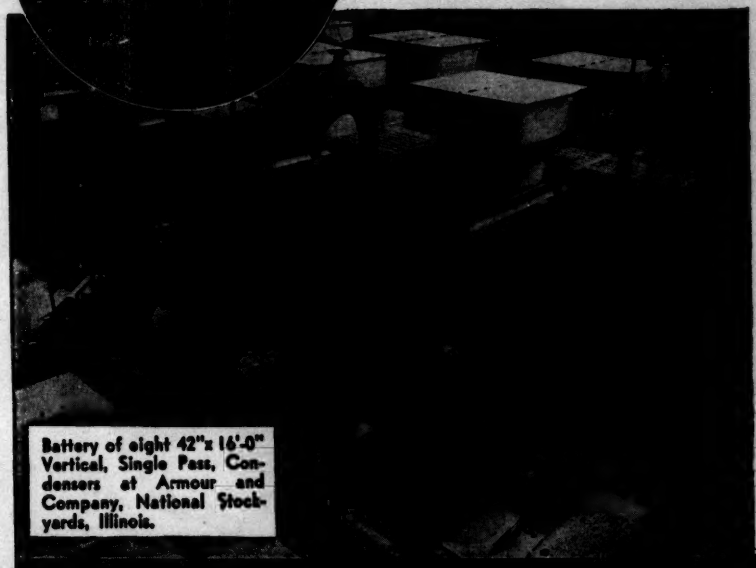

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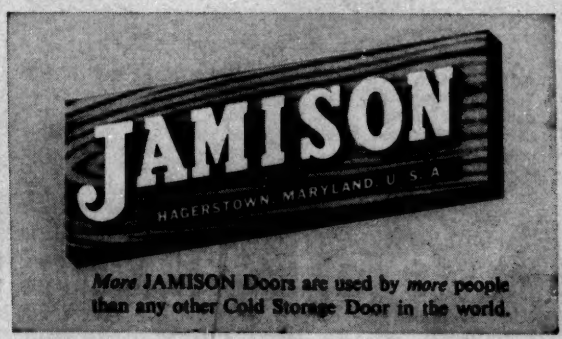

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